ECONOMICS
IN TERMS OF
THE GOOD, THE BAD
AND THE ECONOMIST

Matt McGee
3rd Edition
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DEDICATION

Writing this book was an exercise in enduring opportunity costs – many of which were inflicted upon third parties in the various countries where I visited friends only to abandon them for my keyboard. I will spend years trying to thank the following people:

At first, second and third place, Little Bell; the Very Small Australian Female who forced me to get my act together by making me food and to-do lists. Little Koala, I will never comprehend how someone who is destined to forever view the world from 152.6 centimetres can be such a towering figure. You stood your post and guarded the gates from demons on the outside and fought off those within – and made sure there were Snicker bars and cigars on my desk. You gave me time, space and a continuum – and did the pyjama dance at the same time. You cut a swathe through the thousands of little-things-to-do-popping-out-of-endless-boxes and let me have my cigar and computer time – as long as I finished my dinner. Nobody can ever love you like I do – or buy you as many watches.

To my editor; Rory, who is at the opposite end of the height spectrum. With infinite kindness, patience and common sense, you helped pull me out of a hole and never said anything unsupportive or badgering. I still don't understand how someone can know everything but it seems that you do. You also seem to find time to show me Australia in between bouts with computers and graphs. I owe you a great deal! Beer… I owe you a few beers!

To the incredible colleagues; Tom, I love you like a brother – even though my chances of getting fired increase by a factor of five every time we meet for coffee. Jon, you too are a brother – and you are such that you make Tom look good! Ryan, another brother, words cannot convey what I need to say, so I won't – but you make Jon and Tom look good! I thank all three of you CENSORED for coming by my room every so often to have fun at my expense when I am under threat of getting fired for ‘inappropriateness’ – or to get help stapling your ripped shirts together and to provide you with band aids (which you call ‘plasters’ for some reason) after your wrestling matches between classes. Katie, you are an eye in the maelstrom and we all pivot around you – especially when you serenely make Bloody Marys by the home pool! Adam, a real mate, you made sure things worked and more importantly that we worked – and you skated the fine line of diplomacy in the fracases! IB-Ian, you have been a good mate, a teacher colleague…a rock – a BIG rock! Brett, you cannot imagine what a sanctum sanctorum your humour and civility has provided – and yes, I will continue to steal your whiteboard pens! Buncy, you are a pillar of down-to-earth common sense and cheer – and somebody I’ve always wanted to ask about the ‘Mile High Club’! Pat, we’ll crash your pub much more frequently now – get bigger bouncers.

To Ilung and Suwarni; thank you so much for taking care of me!

To my wonderful students: I dare say we have broken most of the rules at least once – but since you are grade A human beings all we did was have a laugh and get on with our work. I wrote this book with you in mind, knowing full well that few teachers in the world are lucky enough to have young people of your calibre in their classes. The smuggled-in beer for my birthday present was one of the highlights of my teaching life and that picture will be on the first page of the next edition! Under ‘The Good’.


To the incredible people at OSC: Kim flitted by, Keith acted dad, Jo sweated efficiency, Clara forgot her bug jacket, Kostia was…Russian, Jacek spent money on pens – and I miss Gene, Jo, George and the Oxford crowd.

Thank you Christian for my wonderful room, students, gym, food during long evenings at school and very entertaining laconic humour – and for not firing me. Thank you Julie for making sure I survived in the jungle – and for not telling Christian to fire me.

And, of course, to the Indonesian postal workers and customs officers: May you CENSORED CENSORED CENSORED CENSORED CENSORED CENSORED CENSORED CENSORED CENSORED CENSORED CENSORED CENSORED CENSORED CENSORED CENSORED by kind colleagues wanting me to stay out of prison so they don't have to cover my classes).

Matt McGee

Åkers Styckebruk, Sweden, 19th of July 2012
Dear Student,

It won't take you many pages of reading this book to realise that I am a very happy man. I get to do what I love, and I love what I do, which is warp young innocent minds with economics. There is nothing I want to do more than teach economics and hopefully this comes out in the very personal style of writing I use.

This book has been written for you, not your teacher. The theory content is mainstream economics and in accordance with the IB syllabus, but the style of writing is uniquely mine, and will naturally differ from other teachers in general and your teacher in particular. It is most important that you realise this, and that this book – like so many others – doesn't contain the 'truth' in any way, but merely one of many possible versions of what we call reality. You and your teachers will both agree and disagree with some of the content here, and that is exactly as it should be! From disagreement comes discussion and debate. From debate comes argumentation. And from argumentation comes learning – to both sides hopefully.

Life is fun and so is economics. In fact, I cannot separate the two any longer – much to the irritation of anyone who tries to hold a serious conversation with me. I urge you not to regard economics as a subject confined to classrooms and complex diagrams, but as an outlook on life and things happening around you. That is why I have put so many personal little stories in here; to convince you that economics is just a way of putting words to events and concepts thereby providing a little order and structure.

Two small pieces of avuncular advice: 1) Read! Read your textbook – whatever it is – and then read it again. Read newspapers and economic literature on the side. Read blogs and net reports. Read studies and essays by others. When you read economics (or about economics!) you add to your active vocabulary in the language of our Dismal Science. 2) Look things up! Never take 'truths' at face value but LOOK THEM UP. You will be truly amazed at what you find out – as will your teacher. If he/she is a good teacher then they too will look up what you have found. This is called education.

Dear Colleague,

Virtually every economics colleague I meet is either better educated, more experienced, or a better teacher than I. I have realised this for some time and therefore know that they could have written a book as good – or better – than this one. To date there are some five textbooks written specifically for the IB and you are thus not holding what is a book on economics – nor is it the book on economics. It is my book on economics, which means – for better or worse – that the examples and stories are all done from a personal vantage point, and laced with my own rather pithy sense of humour. The personal outlook is intentional, as I wish to show our students that life indeed is applied economics. The stories, jokes and shoot-from-the-hip comments are unfortunately inevitable – I simply don't find anything worth taking that seriously. Especially myself.

I sincerely hope you are not put off by the personal style of writing and come to realise that while there is lots of nonsense interspaced in the text, there is also a good deal of rather sensible and accessible economics. I have found that if one is able to hook new and sometimes intimidating concepts onto scenarios or events which people are familiar with, or can see humour in, learning becomes easier. Economics is not boring or other-worldly, so why should economics texts be that way? It is always easier to pull a piece of string across a table than push it.

Winston Churchill once said; “Criticism may not be agreeable, but it is necessary. It fulfils the same function as pain in the human body. It calls attention to an unhealthy state of things”. I, my editor and proof-reader at IBID have spent countless hours seeking out errors, omissions and mistakes, yet I alone am ultimately responsible. There will naturally be mistakes in the text – either due to oversight or plain ignorance on my part. You and your students would be of invaluable assistance to me if you bring to my attention any and all errors in the text – and/or comment on the book in general. Write to me at matt@goodbadecon.com and the errors will be immediately published and commented on in the “Errata” section of the economics homepage; www.goodbadecon.com. I will answer all serious correspondence.

Yours,

Matt (matt@goodbadecon.com)
USING THIS BOOK

The structure of the book

This book follows the IB syllabus to the letter – in fact, the headings used herein are almost identical to the IB syllabus. I have taken pains to divide the syllabus into 'bite sized' chapters, 96 in all. Chapters 1 to 3 are introductory chapters with a few words on basic terms and chapters 4 to 96 follow the syllabus outline. It is definitely not necessary to follow the syllabus order (in fact, many teachers don’t), yet I would recommend doing Section 1 initially, since the concepts therein are the basis for much of economic theory.

Section 1 (chapters 4 to 35) deals with the economic basics such as opportunity costs and the basic economic problems arising in societies. While this section might be considered a bit long, the intention is to give new students a breadth of examples and illustrations to make the initial meeting with economics as easy as possible. I have taken care to extensively exemplify and illustrate the use of perhaps the most important economic model; supply and demand. Having a solid understanding of how to use and apply the basic supply and demand model makes it easier to learn higher order concepts in later chapters.

Section 2 (chapters 36 to 62) deals with macroeconomics, and at this stage I have assumed students to be comfortable with basic economic concepts, so I have somewhat limited the extent of explanatory text and increased the use of case studies and applied economics.

Section 3 (chapters 63 to 77) focuses on trade issues, and is strongly linked to both micro/macro issues and development. I have put great effort into finding examples and statistics of recent date, and to use as many contextual examples as could be fit in.

Section 4 (chapters 78 to 96) is development economics and builds heavily on concepts introduced in all other syllabus sections. The ‘spread’ of development issues throughout the syllabus is intentional, as IB economics puts major focus on development issues and emphasizes this by relating development to a number of issues throughout the syllabus.

Throughout the book

Numerous ‘Pop quizzes’ have been included in every section and sub-section. These are of ‘Test your understanding of the issues above’ type, and to cut down on the size of the book, all the answers will be housed and periodically updated at www.goodbadecon.com.

Outside the box is where I have put non-syllabus concepts, theories and models. A little depth means that a certain syllabus concept/theory is examined further and/or applied in greater depth. Case studies bring up current and historical events pertaining to economics. Applied economics looks at specific scenarios from an economic vantage point. All of these are really just ‘flesh on the bones’ of the core IB syllabus content, and are included merely to tweak interest and further illustrate the linkage between our complex world and economic thought. Story time is mostly nonsense that I simply couldn’t resist including. All of the content under the captions above is clearly delineated from the core body of text.

At the end of all four syllabus sections – and many sub-sections – I have included a number of short answer and extended response questions. While short answer questions are not really intended for SL, I have deliberately included short answer questions that are applicable to SL content. Data response questions have been left out completely, as I felt it better to cover a wide range of issues in as little space as possible – this is easier to do using short answer and extended response questions. Most schools have a battery of data response questions to use in practice tests and I will continuously upload a variety of these on the Goodbadecon website. Paper 3 questions for higher level are found at the end of each relevant chapter and further practice questions will be on our website.

Also on the website, there will be a section on examination criteria, command terms used in exams and exam, extended essay and internal assessment guidelines and advice, together with some samples. And, in spite of my long-standing dislike of educational practices such as ‘keep it simple silly’ and ‘find the basics really easily’, I have finally been badgered into including a glossary. Such are the forces of demand.
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Key concepts:

- What is economics?
- The good…
- …the bad…
- …and the economist

You know that text at the beginning of books that we all skip? Well, this is it. So, as a Read This! incentive, there is a secret code baked into the first three chapters with which you can login to the IBID site and win US$2,000.¹

One of my many cheeky students was once introducing a new student around and had apparently warned the young lady about me. When they got to my class and had viewed the show for a few minutes, my student leaned over to the somewhat shocked young lady to calm her; “Don’t worry. You get used to him. It’s an acquired taste – it takes about three years.” To which the young lady replied “But we’re only in his class for two years!?” Evil smile from my student, “Yupp! Welcome to economics.”

I’m a teacher. I teach. I love my students, my subject and my job – and all this will come across in this rather personal book for IB students. In using this book you basically become one of my students and thus get to read what all my new students in IB1 hear during the first class:

1. Economics is very cool! Yes, I know; it has a mathematical foundation…and no; very few economists have ever been arrested for tossing a TV out of hotel room after an AC-DC concert. What I mean by “cool” is that our field of study extends to virtually every aspect of society and helps to explain (going from the mainstream to the ridiculous) why taxes on imports (known as tariffs) do not protect domestic jobs in the long run and whether Bon Scott is a more efficient singer than Brian Johnson.²

2. Economics is about real life and real events! It is not some abstraction (= general concept) from the fuzzier parts of TOK – it is largely uninteresting if the tree makes a sound falling in the forest when nobody is there to hear it. We would instead look at how much value-added would be the case in making chop sticks out of the tree or whether the resulting soil erosion would outweigh the benefits to society of 100,000 bento box complements.

Putting 1. and 2. together I argue that a good grip on economic terms and concepts has numerous personal and societal benefits. Without stooping to Gekko’s ‘Greed is good’ credo (= statement of belief) the former might deal with realising that shares in the world leading Danish windmill producer Vesta will rise due to higher oil prices and the warm fuzzy feelings that come with being an

¹ You do realise I’m lying. Right?
² Singers in AC-DC. You think I’m making this up? Check out “Who is the most efficient singer in AC/DC, Bon Scott or Brian Johnson?”, University of Calgary archives at http://impra.ub.uni-muenchen.de/3196/
owner of shares in renewable energy companies. As for societal issues, economics provided decision makers in the UK government with sound arguments for spending around £1.2 billion in taxpayers’ money subsidising 100 Vesta windmills, which were put in place in 2010 by the Swedish firm Vattenfall in the largest offshore wind farm off the coast of Kent in the UK.3

4. Finally, economics is not a “dismal science”4 but in fact a most optimistic and heartening field of study. The basic facts are that in many respects humankind is increasingly better off; we live longer and healthier lives and have immensely increased the opportunities, choices and abilities to lead better lives – noting of course that there are some notable and distressing exceptions and that the future is by no means certain.

The Good…

IB2 dinner at Hacienda Morales “Split the check amongst yourselves while I finish my cigar, ladies and gentlemen!”

The picture above is the one I use as my desktop on my computer – mostly to remind myself how incredibly fortunate I am. My IB2s and I decided that we needed a good meal so we went to Hacienda de los Morales in downtown Mexico City. Sitting around the table after dinner with a good cigar and Cognac, it struck me that this group of young people were one of Mexico’s strong hopes for a better future. These “Zero-Point-Two Percenters”, as I call them,5 would basically become the movers and shakers of tomorrow’s Mexico. I remembered how I introduced the topic to them some 1½ years earlier:

“Listen up people! Here’s the deal. First off, economics is the study of us; as economists we are basically studying what we are, how we have created societies and what drives us. In studying this we are gathering information in order to outline possible solutions to very real problems and my key point here is that economics is not an abstract study (= purely theoretical or hypothetical) of “numbers and money” but an applied science. We look at reality with the intention of using information gathered in order to construct models and theories useful in real life, for example issues such as how to increase the production of food and goods without causing irreparable damage to the environment. Secondly, as I have said, economics is not a “dismal science”6 but in fact rather an optimistic science. The basic facts are that, despite the exceptions, life has got better for most people as time has passed. My editor tell me that, when his parents married, average life expectancy was 31 years. It is now 67 years. It is the exceptions to this progress that you must deal with and thank god for a good education!”

…the Bad…

“Left hand down a bit, there’s a break in the fumes ahead.”


4 The term “dismal science” was apparently coined by Thomas Carlyle in the 19th century as an argument against economist’s opposition to slavery! However, the term is often attributed to Thomas Malthus of “The end is nigh” fame due to his prediction in the late 19th century that the economics of population and food guaranteed that population would ultimately exceed potential food production. No, it hasn't happened – we produce more food per capita today than ever before in the history of mankind.

5 As they are undoubtedly part of the 0.2% wealthiest group of humans ever to walk the face of the earth.

6 A quote commonly attributed to 19th century author Thomas Carlyle who was referring to the economists Thomas Malthus and David Ricardo.
Anybody who's read a newspaper has been bombarded by the gloom and doom scenarios which seem to sell a lot of papers. Decreasing natural resources together with increasing population gives us the core question of how the on-going depletion of natural resources and rising populations can be met by increased efficiency in the production of food and the development of alternative energy sources. The future scenarios are most uncertain but, as one single example, economists take into consideration the prospect of a production peak for oil (it already has according to the Energy Watch Group!) and that decreasing oil production together with the depletion of natural resources might result in falling food and industrial production. Other notable issues facing our world are land/soil/air/water pollution, global warming, desertification, HIV/AIDS, poverty levels, unemployment and so forth.

...and the Economist

“John Maynard Keynes, 1883 – 1946. ‘…a man of genius…//…who…had a world-wide influence on the thinking both of specialists and of the general public…’

So what do we do in economics? We study these issues from the point of view of how societies' wants and needs can be met now and in the future. John Maynard Keynes, perhaps the most famous of all modern economists, claimed that economics was the most difficult of sciences, as one needed to be a mathematician, philosopher, politician and psychologist. A standard textbook definition would be along the lines of “Economics is about utilising and allocating scarce economic resources to achieve optimum output and/or utility”, and most of my colleagues would agree that three key concepts are at the heart of economics, namely scarcity, resource allocation and incentives.

The first two concepts deal with how societies use scarce resources to produce the endless needs and wants in society. The third issue is that of how people, firms and institutions will act in accordance with these needs and wants; the willingness and ability of households to save, work and start businesses; the willingness of firms to invest, produce and innovate; and the willingness and ability of institutions to regulate such transactions and provide safety nets. In keeping with my hard-earned gunnery sergeant image, I simply say that economics is about incentives – everything else is a footnote. I also make sure that my bright-eyed and bushy-tailed younger students get to hear me – at least once during the first week – that “…you're born, live through an endless series of trade-offs, and then you die…”

Basically, economics is the study of:

1. Trade-offs or opportunity costs (money going into arms means less food)
2. Choices (why guns and not food)
3. Incentives (how do we get people to produce guns rather than food)

Chapter 2 deals with the basic economic problem which is squarely centred on the three questions above and Chapter 3 with basic data skills. These chapters are not part of the syllabus but I don't want any student of mine to be ignorant of the most basic economic issues and ways of compiling/using data.

7 The Guardian, 22 October 2007, “Steep decline in oil production brings risk of war and unrest, says new study”
8 From The Times obituary, 22 April 1946
9 Keynes’ exact words were: ‘...the master economist must possess a rare combination of gifts... He must be a mathematician, historian, statesman [and] philosopher - in some degree. He must understand symbols and speak in words... He must study the present in the light of the past for the purposes of the future. No part of man's nature or his institutions must lie entirely outside his regard.’ (See Essays in Biography. The Collected Writings of John Maynard Keynes, Vol.X, Royal Economic Society. Published by MacMillan Press Ltd 1972.)
10 Allocation is central to economic terminology. It means roughly, ‘placement;’ or ‘the placing of’.
11 Yes, I stole this from somebody. Economics doesn't repeat itself, economists repeat each other.
During the Great Depression in Australia during the 1930s unemployment rate was high and many people were desperate to get work. It was common for men to walk the roads in search of work, often it was simply for their ‘keep’ which means food and a bed. Their bedroll was referred to as a ‘matilda’ or ‘swag’ as in the song ‘Waltzing Matilda’.

The photo shows a young man, Murray Greig, who decided to ride his bike and he also constructed a trailer to carry his belongings in search of work. He left his home in Melrose in 1935 at the age of 22 and headed east to Victoria and then north through New South Wales and then Queensland. Motor vehicles were not common and the roads were not well made and subject to flooding and other damage. He often had to carry his bike and belongings on his shoulders.

His work included tending stock, clearing land, breaking horses and tractor driving. He was also quite successful in amateur bike racing which supplemented his meagre income. He eventually arrived in Queensland in 1939 where he spent about a year cutting sugar cane before returning home. He then enlisted in the War, serving overseas and then marrying, raising a family of 5 and being a successful farmer.

... and hope!
2. Introduction to Basic Economic Terms

Key concepts:

- Factors of production
- Scarcity
- Basic economic problem
- Opportunity cost
- Production possibility frontier (PPF)
- Positive and normative statements
- Utility and marginal utility
- Micro and macro

Factors of production

We use the term ‘resources’ a great deal in economics, and traditionally assign all economic resources four headings; land, labour, capital and entrepreneurial spirit. These four groups constitute the factors of production used, to one extent or another, in the production of all goods.

Land is used in a wider sense, and covers not only the use of land for farming and space for factories, but to a wide variety of natural resources such as oil, water, timber and ore. One often uses the term raw material for these natural resources. Land is also agricultural goods such as rapeseed and fish from the sea. All of the aforementioned resources are often referred to as primary goods, (or primary commodities) and I often tell my students is that "If you can dig it up, chop it down or pluck it, it's a primary good".

Labour is pretty much self-explanatory but it is worthwhile to note that it is often the element of labour that adds value to all basic natural resources and transforms basic (simple) goods such as silicon and oil into higher value goods such as silicon chips and the plastic casing used in the computer I am using to write this.

Capital is any man-made factor of production, such as a factory or machine. Yet the term is more far-reaching, as it can also mean the whiteboard pen I use to fill the board when I am using it to produce education. Capital, as a term, is specific in that the item must be used in the production of goods and not in simple consumption. One could say that capital is defined more by usage than anything else. A guitar in my hands is simply a consumer good (and a mistake) while in the hands of Lady Gaga it is a capital offence…sorry, that's 'capital'.

The entrepreneur is the person who brings the other three together and creates goods to fulfil wants and needs in society. From Edison’s light bulb to Picasso’s painting Guernica all production necessitates the idea, drive, and ambition of an entrepreneur to put land, labour and capital together and create something. As a personal addendum, I would add education, training and experience to the four production factors above – this is commonly referred to as ‘human capital’. Human capital is frequently considered of increasing importance in modern production.

Definition: ‘Resources/factors of production’
The factors of production are commonly divided into land, labour, capital and entrepreneurial drive. These are the resources necessary to create/supply goods and services in an economy.

or resources – just try to build a boat on a deserted island with a stack of Yen!) 'Capital' is one of many terms with subject-specific meaning which also has other, wider, meanings outside of economics. In its purest usage in economics capital is a man-made factor of production, yet in a wider more general way we use it to stand for financial or physical assets which can generate income, such as property or shares in a company.

1 Be very careful in using the term ‘capital’ in economics! Very often the term is confused with ‘money’ – which is NOT a factor of production. (Money is just a representation of goods
In outlining the factors of production (land, labour, capital and the entrepreneur) available to the economic system, we inevitably come upon the issue of **scarcity** which has a rather specific meaning in economics as it goes to the very heart of what economics is all about, namely the optimal use of resources. Scarcity means that all societies face the common problem of limited resources and how to best allocate these resources to provide for our endless wants.

Scarcity is a universal problem, but does NOT necessarily mean that all peoples in all economies lack the same things! A most valuable resource is water, which the Swedes have in abundance in Sweden but has to be shipped in by tanker every day to the Greek island of Hydra where I lived as a child. On the other hand, on Hydra there is no lack of master stone-masons and marble, enabling marble sinks, counter-tops, tiles – we actually had a toilet seat made out of marble!² When I think of it now, the amount of marble we had there could have funded my university studies.

This is my point; scarcity is an issue for all nations and has been for all time. It’s simply a matter of what is scarce and the reasons for this relative scarcity. Scarcity is defined by availability of resources, true, but also by our wants and desires, which are infinite. No matter what need is fulfilled, there is always another lurking in the background and this is true in all people. Naturally all these needs cannot be satisfied as there are limits to society’s ability to satisfy them, the reason being that while our needs are seemingly *endless* the resources (land, labour, capital…) used in satisfying them are quite definitely *finite*, or limited. Scarcity is what one might call a triumph of harsh reality of the inborn wants of man; all societies during all ages will have wrestled with the abundance of human wants, the inability of the economic system to supply all wants, and the resulting choices resulting from scarcity of available resources.

The **basic economic problem** that economics seeks to address has permeated all societies throughout history:

- **What** to produce?
- **How** to produce it?
- **For whom** to produce it?

The first issue, ‘**what**’, deals with the allocation of resources to make the goods that society wants. The issue can be as trivial as ‘red shoes or blue shoes’ or as broad as the classic ‘Guns or butter’ question we shall look at in just a moment. The issue of ‘**how**’ deals with production methodology, organisation and technology. The final issue, ‘**who**’, is the wider issue of distribution, i.e. to whom the spoils of production go. All societies have to deal with these issues, from the Aztec society which created the lookout tower up the hill here on Expat Street in Mexico City, to the centrally planned economy of Cuba which made the excellent cigars I – but not the diners at the table next to me – enjoy.

### Definition: ‘The basic economic problem’

The enduring central issue of economics; how all human societies, throughout time, are forced to deal with the questions of **what** to produce, **how** to produce it and for **whom** to produce.

### Opportunity cost

Resources are scarce and societies’ wants are endless; this means making a choice which in turn means giving something up. An **opportunity cost** arises as soon as one alternative means giving up the *next best* available alternative. For example if my preference ranking (in descending order) in spending $US10,000 is 1) a Blancpain watch; 2) 4 weeks vacation in Cancun; 3) a new car, then in choosing the Blancpain my opportunity cost is 4 weeks vacation – not the new car, because my opportunity cost is the highest ranking – *e.g. second best* – alternative I give up.
Basic Economic Terms

**Definition: ‘Opportunity cost’**

Opportunity cost is the option foregone in making a choice of “Alternative A” over “Alternative B”. Assuming that all possible choices have been ranked in order of preference, the **opportunity cost** is the relinquishing of the second best possible alternative, i.e. the next best foregone opportunity of obtaining the highest ranked of all possible alternatives. The concept is fundamental in all subsequent economic concepts.

The issue of ‘what/how/whom’ is naturally one of choices. In some way, one has to choose between options. Let us use the learning tool of choice for Aristotle; the **syllogism**. A syllogism is a set of factual statements ordered in a state of natural progression which all lead to an (inescapable?) logical conclusion. The classical syllogism is one where Aristotle referred to his teacher Socrates:

1. ‘Man is mortal’
2. ‘Socrates is a man’
3. ‘Socrates will die’

The economic syllogism is somewhat less dramatic:

1. People’s (or society’s) wants are infinite
2. Resources are finite
3. Choices must be made

We’d best comment on the above, primarily in order to explain and perhaps defend the premises therein.³ Most people would ultimately agree that, no matter what one has attained, one always has an additional want. Mick Jagger couldn’t get no satisfaction (and knew You Can’t Always Get What You want) – and he was a drop-out from the London School of Economics! Fulfilling one’s desire for a new watch doesn’t mean that one wouldn’t want a vacation in Cancun and a new car to drive there in. Even Bill Gates, who has earned millions in interest alone during the time it has taken me to write this section, will have unfulfilled wants.⁴

The premise of endless wants and thus hard choices holds as true for society as for the individual. A municipality (= local government) might face the decision of allocating funds towards new computers for the local public school or an all-expenses-paid fact-finding mission to Monaco for municipal councilmen and spouses. National government might have a choice between 15 new fighter jets and a new cancer research centre. To phrase it in economic terminology, there are simply too few resources (e.g. land, labour and capital) available to enable all wants to be taken care of. We are thus presented with interminable **trade-offs** at personal, municipal and national level: the Blancpain or vacation; school computers or vaca…em…fact-finding mission; fighter jets or health care. A trade-off means mean an opportunity foregone.

**Production possibility frontier (PPF)**

All economies face the same issues outlined in the basic economic problem of “what to produce…how…and for whom”, and all economies face infinite wants and limited resources.

Assume a small island economy, Sifnos, and the following:

1. the economy only has the resources to produce **two goods**, pottery and tourist services
2. there is a known maximum output and the economy can attain this level – i.e. the economy can fully utilise all resources so there will be no unemployment or idle machines
3. there is **no trade** with other villages, thus production equals consumption (much more on this in Section 4)
4. that any given quantity of resources transferred from one sector to another are **unequally productive** (or re-allocatable) – all resources used in the production of pottery are simply not equally productive in the production of tourist services.

Figure 2.1 shows a few of the possible combinations of output in the Syfnos economy. The PPF is drawn assuming that all factors of production are fully utilised whereby any combination of output within the PPF (point E) shows that the economy is producing at a sub-optimal level, e.g. that there is unemployment, idle capital or unused natural resources. Points A to D make up the boundary of possible output (maximum efficiency – see Pareto optimum, Chapter 7), and point F is outside the PPF and thus impossible to attain.

³ We will be using the term ‘premise’ rather often. A premise (pl. premises) is a basic assumption – often in a line of reasoning or argumentation where the premise must be included at the outset in order for subsequent conclusions to hold true. For example, my premise in writing this is that my students are adequately versed in English.

⁴ Detractors may say that ‘world domination’ comes the closest.
Figure 2.1 PPF for Sifnos – increasing opportunity costs

Figure 2.2 illustrates the issue of opportunity cost. Output ranges from 600,000 hours of tourism and zero pottery to 5,000 tonnes of pottery and zero hours of tourism. Let us say that Sifnos is at point A, where the Sifnians are producing 600,000 hours of tourism and nothing else. Moving to point B to produce the initial 1,000 tonnes of pottery entails giving up 20,000 hours of tourism service, which is thus the opportunity cost of the first tonne of pottery. The striking difference for the Sifnians will occur when they increase output of pottery further, from point B to C along the PPF. It is immediately obvious that the cost ratio has changed – the second 1,000 tonnes of pottery entails giving up the production of 40,000 hours of tourism service. In other words, the opportunity cost of the second ‘batch’ of pottery is 40,000 tourism hours – twice the cost of the first ‘batch’. Moving from point C to D we see how the opportunity cost of pottery production rises to 140,000÷1.8 ≈ 78,000 hours of tourism per tonne of pottery.

Moving from point A to point B increases output of pottery by 1,000 tonnes but reallocates resources from tourism – which decreases by 20,000 hours. The opportunity cost of the first 1,000 tonnes of pottery is 20,000 hours of tourism.

Moving from point B to point C increases output of pottery by 1,000 tonnes but, having already reallocated the best resources for pottery production, more resources have to be taken from the tourism sector. The opportunity cost of the second 1,000 tonnes of pottery rises to 40,000 hours of tourism.
Opportunity costs occur in economies because resources are scarce. Increasing opportunity costs in production are due to the fact that all resources are not equally re-allocatable or, to use another phrase, factors are not perfectly mobile. When the Syfnians re-allocate limited (scarce) resources from tourist services to pottery the best available resources (factors) in the production of pottery will be used first. As additional factors are taken from tourism, the economy is forced to use increasingly less productive resources in the making of pottery and thus will have to take increasing amounts of resources out of tourism production. Each additional unit of pottery will result in increased opportunity costs.

In Figure 2.3 (I) at right, the economy shows economic growth since actual output has expanded from point A to B. Our model economy has just increased the production of both capital and consumer goods while the PPF remains in place. This example of growth illustrates that unused resources have been put into use. For example, firms start utilising unused machines and hire previously unemployed labourers. Note that we are assuming that the quantity and/or quality of factors of production remain the same so the PPF has not shifted. Points A to B could illustrate an economy recovering from recession – previously unemployed labourers are hired and idle machinery is put to use.

Remember, the PPF is a purely hypothetical construct; we have already taken into account all possible production circumstances such as technology, labour skills and quality of raw materials in drawing the curve. That is why more or better use of existing available resources illustrates growth in the PPF without an associated shift in the PPF. Figure 0.3 I. and Figure 0.3 II illustrate the effects on both potential output (the PPF shifts outwards) and actual output/growth (point A’ to B’). The increase in productive potential and subsequent actual growth is the result of more and/or improved resources being put to use.

An increase in the quality or quantity of available factors of production increases potential output (PPF₀ to PPF₁), and as these factors are put into use the economy grows (point A’ to B’).

Changing the quality of the factors of production

An increase in the quality of labour, such as education, training, and experience, will inevitably result in the ability of labourers to produce more goods during any given period of time. The quality of land can entail new farming methods, high-yielding crop types, or purer iron ore for making steel; improved capital, such as production technology could render more widgets per hour and

Yet anyone having spent a summer working on an assembly line, as I have, knows that one uses one’s experience and skill to have longer breaks – not to produce more! I gleefully note that the firm in question went bankrupt.

A ‘widget’ is a fictitious/hypothetical product or ‘thing’. Economists use the term ‘widget’ to make up for a sad lack of fantasy and imagination in trying to conjure up good real-life

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Note that ‘point to point’ movements in PPF diagrams are grossly exaggerated. In Figure 2.3 I above, it appears as if both consumer and capital goods have increased by 25%. Again, keep in mind that the diagram is only a description and not a scaled representation of reality.
Definition: ‘Positive’ and ‘normative’

Positive statements are based on facts or evidence, free from value-laden and subjective standpoints. They can be proved or disproved using a scientific approach. Normative statements are based on norms, thus they are subjective and biased – they can not be proved or disproved. “Man evolved from apes...”, a Darwinist proposition, is a positive statement while “Man was created by god...” is clearly a normative statement.

The aim of economic theory is to provide a basis for analyses which is as unburdened by normative statements as possible. Generally speaking, scientific research should be confined to positive questions – i.e. questions or hypotheses which can be either verified or falsified by looking at real life observations and data. The stricter we are in our use of definitions, assumptions and consequent models, the more we can weed out the more emotional aspects of economic conclusions. Economics as a science attempts to outline ‘good’ and ‘bad’ without resorting to subjective views. An economist aims to pose questions that can be stated positively by defining ‘good’ and ‘bad’ in economic terms rather than moral terms and then answering the questions by examining facts and evidence.

Utility and marginal utility

Utility refers to the usefulness perceived and satisfaction derived from the consumption/use of a good. The perception of a good's utility forms our preferences. The term springs from the Latin 'utilitas', meaning usefulness or applicability. Just think of 'utensils'!

Definition: ‘Utility’

Utility is the benefit/satisfaction/usefulness one gets from the consumption of a good. The concept is quite obviously highly normative as peoples' preferences vary greatly. My perceived usefulness will not be the same as yours.

Utility is one of the classic abstract concepts, right up there with 'quality' and 'happiness'. (In fact, I once bet one of my students $US100 that he could not define 'quality' and he never got products in textbook examples.

8 A norm is a rule or guideline arising from within the evolved standards of a society, e.g. "Socrates should be punished by being forced to drink poison!"

9 This translation was provided years ago by Pia Birgander, my incredible IB coordinator in Sweden. She knows about 18 languages, Latin being but one. Now, having her around is utility – talk about useful!
Story-time! “You did what?!”

This was voiced loudly and almost in concert by a group of colleagues who had gathered for evening grape juice (= wine) and yummies at one of the houses along Expat Street here in Mexico close to the school we all work in. Word had apparently spread that I’d bought a new watch for some ungodly sum and Marc – being a stout Yorkshire lad with no inhibitions whatsoever – handed me my wine, glanced at my watch and said “Ay, looks good! I used to see those all over the place in the black markets in Vietnam”.

“You most certainly did not”, I growled. “This isn’t a back-alley copy but the real thing – proudly manufactured in Geneva by the Little Swiss Watch Gnomes.”

By this time my friends in the know were all grinning like possums eating the core out of a Mexican cactus, waiting for Marc’s look when he found out how much it cost. I can’t quote him in print, but basically he said “You’re crazy!” It took about 3.4 seconds for this to become the consensus view and if their looks had taken on physical action I would have left the party in a straitjacket. Virtually everyone had different views on “…the insane waste of money…” and “…what one could have gotten instead…”.

The alternatives ranged from a new car to 4 weeks at a good hotel in Cancun or Acapulco. What they also all agreed on was that I shouldn’t wear it anywhere “risky” – which in Mexico means “…anywhere outside the house and/or near the police”.

The point of this story is that the satisfaction I feel from wearing (e.g. consuming) the watch is different from what the others would feel. I derive such pleasure in owning fine mechanical timepieces that I am prepared to pay a great deal for them – and thus give up numerous other goods. In economic language, I am spending my income in such a way that I get maximum pleasure from the goods I spend my money on – I am maximising my utility. Any other option would have added less to my overall sense of satisfaction. By allocating my income towards the consumption of a (-nother) watch, I added to my “happiness” the most. This is marginal utility, dealt with next.

Simply, utility differs between prospective customers and this steers preferences and therefore selective perception. While perhaps you are fogging up the window of the Italian shoe shop, your friend might be smearing nose grease on the armoured glass in front of the Swiss watch shop.¹⁰

¹⁰ Take it from an old person: don’t shop in pairs! The opportunity cost of looking at things which bore you out of your skull quickly becomes unbearable when you realise that you are giving up your own valuable shopping time.
Utility is at the heart of economic reasoning when it comes to analysing people's wants and purchasing habits. As we shall see, utility explains why we buy a good in the first place – but the concept does an even better job of explaining why we buy goods in the second place! Say what? 'Second' place? Well, stop and think; have you in fact bought many single goods in your life-time? Are we not, in fact, constantly buying more goods, i.e. another good rather than a good?! If so, then it should be of far greater interest for the social scientist to explain why we buy an additional unit of a good rather than the first one, seeing how recurrent purchasing is far more common than a 'virgin' purchase. Point in fact; I wasn't buying a watch (see Story Time below) but another watch. Thus we need a concept which addresses the addition to utility caused by consuming one more unit of the good. This is marginal utility.

Definition: ‘Marginal utility’
The addition to total utility (i.e. total benefit/satisfaction/usefulness or well-being) resulting from the consumption of one more unit of a good. Ultimately choices are based on the perceived marginal utility of one more unit of a good.

My favourite example of marginal utility – and one which lends itself to immediate recognition and knowing laughter by every student I've had – is the 'cold beer in the desert' allegory (= comparison). Picture yourself marooned in the Kalahari with nothing but the clothes on your back and your trusty credit card securely tucked away in a Velcro pocket. You set off on foot towards what you hope will be the nearest town. It's 45° C in the shade – which would be fine if there was any shade.11 But you are walking in the mid-day sun, which is hot enough to fry the niblets off a bronze elephant.12 Walk, walk, walk. Sweat, sweat, sweat.13

Suddenly, through the shimmering heat waves and consequent mirages, you see a large parasol in the distance. You do a high-speed shuffle towards it and coming closer discover that it is real – you also see the painted sign with the legend ‘Mabogunje's Finest Kind Cold Refreshments! All major credit cards accepted!’ There are a number of bar stools set out in front of a bar counter. You set yourself down on one of the stools in front of the smiling Mabogunje, slap your credit card on the bar and order a beer. Mabogunje pulls the draft-lever a few times and sets an ice-cold pint of beer in front of you.

You start slow and end fast – just like a good opera. Indeed, quaffing away there, you actually hear blissful choirs and feel like the injured Tristan being cured by Isolde. What sweet satisfaction! 'It ain't over 'til the Fat Lady sings,' you think and order another beer...

Whap! Mabogunje slaps another cold one on the counter and whips your card through the register. Your initial thirst having been satiated (=satisfied), you drink the next one with a bit more ease. It too is incredibly tasty – though it doesn't quite give you the lust-filled experience of the initial stein. Still, it's satisfying enough for you to want a third…which is, again, very tasty but not quite in the same satisfaction-league as the previous. You feel better and better after each additional beer – but not at the same rate. This continues through the 4th, 5th and 6th beer. Each additional beer will add to your overall satisfaction – and inebriation – up to the 7th beer.14 Putting this little story into the traditional illustrative method of the economist, we get tables and diagrams.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Total utility</th>
<th>Marginal utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>→100</td>
</tr>
<tr>
<td>1</td>
<td>100</td>
<td>→ 70</td>
</tr>
<tr>
<td>2</td>
<td>170</td>
<td>→ 45</td>
</tr>
<tr>
<td>3</td>
<td>215</td>
<td>→ 27</td>
</tr>
<tr>
<td>4</td>
<td>242</td>
<td>→ 15</td>
</tr>
<tr>
<td>5</td>
<td>257</td>
<td>→ 5</td>
</tr>
<tr>
<td>6</td>
<td>262</td>
<td>→ –3</td>
</tr>
<tr>
<td>7</td>
<td>259</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2.4 Table of total and marginal utility

The table in Figure 0.4 above shows how total utility increases – but that each additional beer adds to total utility less than the previous beer. Shakespeare was well aware of marginal utility when he wrote “Can one desire too much of a good thing?” The

11 The correct term for °C is degrees Celsius – not 'centigrade'. The scale was invented by the Swedish scientist Anders Celsius in 1742. (Source: http://www.astro.uu.se)
12 I dare not go into the subject of niblets. You are much too young and innocent.
13 Or 'Perspire, perspire, perspire' if you are being polite.
14 This is when you inadvertently start crawling in the sand violently sick or fall into a drunken stupor. Or both – in that order.
Basic Economic Terms

Marginal utility has wide applicability in the study of demand patterns. It helps to explain consumption habits and patterns and also why goods such as diamonds – which are in no way necessities – are very dear, while water – which is an essential of life – is nowhere near as expensive as diamonds. I shall return to this classic economic conundrum in Section 2.2.

Micro and macro

Microeconomics centres on the forces working at the individual level, e.g. the individual firms’ and consumers’ (often bunched together in households) behavioural patterns and decision-making processes. Here economics focuses on the needs, desires and buying habits of the individual consumer in conjunction with the output capabilities of firms for particular products. In short, microeconomics looks at firms’ outputs and pricing decisions and consumers’ purchasing decisions, for example studying how firms react to increasing costs of production by raising the price and subsequently how consumer/household spending is adjusted when the price rises.

Withdrawing from the study of individual market participants in order to study the broad interaction of the aggregate (= sum, combined, cumulative) of separate (micro) parts is the purview of macroeconomics. The four main issues here are aggregate output (and thus economic growth), price level (and thus inflation), labour markets (e.g. unemployment), and finally foreign sector dealings (such as the balance of trade and exchange rates). Central to the study of macroeconomics is the business cycle (also known as the trade cycle), which shows total output in the economy over time – this is often put into the context of variations in economic activity (recessions and expansions) and the links to macroeconomic policy.

Definition: ‘Micro economics’

Microeconomics is the field of economics dealing with the relationships between individual components in the economy; firms, industries and consumers (households). This interplay is the basis for individual markets.

Definition: ‘Macro economics’

The sum total of all micro parts, the aggregate of individuals’ and firms’ behaviour. The four main areas of study are: 1) growth (increase in total output); 2) price level (inflation); 3) labour market (unemployment) and; 4) the balance in the foreign sector (exports/imports, exchange rates).

Figure 2.5: Total and marginal utility of drinking beer in the desert
Let us compare the two using a few examples:

Looking at how a firm reacts to increased demand for its product is a micro-issue while studying the effects on all firms in the economy due to a general increase in demand is a macro-issue; the decision of a worker to work less due to lower wages is micro while total hours of labour (and unemployment) is macro; the effects on an industry (= group of firms producing similar goods) due to higher labour taxes is micro while the effect on total production in the economy due to taxes is macro; government legislation aimed at monopolies is micro but government legislation aimed at increasing taxes on profits for all firms is macro.

The distinction between the two areas is admittedly blurred, somewhat contrived and ultimately none-too-useful. I often find the two areas overlapping and would be hard put to draw a concrete line between them in many real life situations. Basically the difference isn’t vitally important unless an exam question addresses the issue… which is just the sort of statement designed to get me into a hefty argument with some of my colleagues.15

Summary & revision

1. Economics deals with societal wants and the ability to provide these wants using scarce resources (factors of production – land, labour, capital and the entrepreneur).

2. Economics deals with the trade-offs we face every day, ranging from the question of going to the movies or doing homework to the use of government funds for producing weapons or schools.

3. Resources are scarce since it is impossible to satisfy endless societal wants.

4. The basic economic problem is what to produce, how to produce it and to whom the goods will go.

5. For every use of resources there is an alternative use – this gives rise to opportunity costs, i.e. the second best alternative foregone (quantity of Good B) in the production of a given quantity of Good A.

6. The PPF shows the possible combinations of output in an economy. The boundary (frontier) is where all factors are fully utilised. A shift outward of the PPF (economic growth) is caused by an increase in the quality and/or quantity of factors of production.

7. Positive statements are statements which can be proven or disproven. There is no evaluation or value-laden element in such a statement.

8. Normative statements are subjective. They cannot be proven or disproven.

9. Utility is the benefit or satisfaction derived from consuming a good. Marginal utility is the satisfaction derived from the consumption of one more good.

10. Microeconomics looks at the individual level of firms and households while macro looks at the aggregate (sum) of all households’ and firms’ activities such as unemployment, inflation and economic growth.

15 I answer all correspondence. Please write to me at matt@ibid.com.au

14
3. Introduction to Basic Data Skills

Key concepts:
- Models
- Correlation
- Causality
- Nonsense (spurious) correlation
- Indexes

You will have to deal with data in economics, both in writing your economic analyses for internal assessment and in your exams. Internal assessment comprises 20% of your total grade and the data response questions 40% at SL and 30% at HL. This section takes a look at how models are built, some common types of economic data and how these are frequently presented in tables and diagrams. One main objective here is to get you to understand the difference between correlation and causality as these concepts are very useful in evaluating/criticising data which has been compiled (= put together) for you in tables and diagrams. Another objective is to clearly outline the difference between data based on stock and flow values. Finally, since so much economic data is given in index form to enable comparisons between countries and over time, basic index series will be looked at.

Models

Models in economics are based on observations of real life and then trends seen in data collected.

1. The first step is to organise reality in a rational manner by observation and subsequent gathering of data. It is most important to define the concepts that are being systematized; if we are studying income and the effects on consumption then it is imperative to clearly outline whether we are looking at gross or net income, including social benefits or not, what time period, which population…etc.

2. Step two is spotlighting aspects of the data in order to see whether any patterns emerge. Any and all models and/or theories which emerge will inevitably be limited in applicability, but the basic strategy is to find correlation (= a relationship or correspondence) between the variables being studied. We might see that consumption increases as net incomes rise, e.g. positive correlation between the two variables.

3. Finally, one formulates a hypothesis based on any patterns. For example, this might be; ‘Increased income results in an increase in consumption.’ One then tests this by applying the model to other sets of data (such as the income and consumption figures over a longer time period or for another country) in order to see whether the model has more general applicability. This means testing whether the results are generally consistent with the theory being formulated. A key issue here is if variable X causes a change in variable Y…or vice versa. This is the issue of causality.

Correlation

When a set of data shows that there are visible and perhaps predictable patterns in the variables in our data, we speak of correlation. Note that high(-er) values for income and corresponding higher(-er) values for consumption is positive correlation, while high(-er) values for income and low(-er) values for birth rates would show negative correlation.

For example, one of the models used in macroeconomics is the Phillips curve, which shows how inflation (rise in the general price level) and unemployment (percentage of working population not holding a job) are related over a period of time. Up to the 1960s in the US there was strong negative correlation; when unemployment (U) rose inflation (i) fell…or maybe I should say that when inflation rose unemployment fell!? In
economic shorthand we would pose this as ‘\(\Delta U \rightarrow \Delta i\)’ and ‘\(\Delta i \rightarrow \Delta U\)’ respectively.\(^2\)

**Causality**

This is a common conundrum (mystery, problem) in economics and indeed in all the social sciences; what causes what? Here, does the change in unemployment cause the change in inflation or the other way around? This chicken or egg problem is known as **causality**, which basically looks at the relationship between variables and seeks to highlight which is the **cause** and which is the **effect**.\(^3\) Let us look at a simple example.

**Nonsense (spurious) correlation**

*It is important to note that correlation is NOT the same as causality!* Consider three variables; income, consumption and birth rate. Standard economic theory shows that an increase in general incomes in a country will lead to higher consumption rates as any given percentage of income going towards consumption will necessarily mean higher consumption as incomes grow. We have **positive correlation** between the variables income and consumption. Studies also show that as incomes grow (on a national level) the birth rate markedly falls – this means that there is **negative correlation** between income and birth rates. Hence, a collection of data on birth rates and consumption might show how birth rates fall when consumption in households rises – this would in all likelihood be an example of ‘spurious’ or **nonsense correlation**.

Thus, while there is correlation in all three cases above, one would be on thin ice indeed in claiming that there is also **causality** in all pairs. In the case of income and consumption most economists would agree that the increase in income causes an increase in general consumption – a relatively clear example of cause and effect. Most studies would also show that increasing incomes over time leads to a drop in birth rates (often measured as ‘live births per 1,000 women’) as higher tax revenues provide social welfare systems and pension funds which in turn enable couples not to have to rely on having a good many children to take care of them in times of need and old age. Rising incomes will cause lower birth rates. In other words, there is also a causal flow (causality) in regards to changes in income and subsequent changes in consumption and birth rates.

The point to be made now is that if we were to study the variables ‘consumption’ and ‘birth rate’ we might well find that there would be negative correlation; as total consumption rises over a period of years, birth rates fall! This is where a good, sceptical outlook on the use of statistics is absolutely vital. It is pretty obvious that increased consumption does not cause lower birth rates or vice versa, but that the two are in causal contact with a common underlying variable; income. Figure 3.1 below illustrates the difference between the variables that are correlated and the variables which show causal links.

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\(^2\) In fact, the answer is probably neither! It is, instead, the underlying change in overall demand for goods and services that causes both inflation and unemployment to change. See Chapter 54.

\(^3\) While this might seem rather trivial and straightforward, I assure you it is not! Some of the most heated debates and schisms (divisions, splits) between economic schools of thought have arisen over this issue.

\(^4\) They must have been listening to an early version of rap music. Proto-rap, maybe.
ultimately could lead to increased harvests and falling grain prices and, in turn, trigger a crisis. Churches are more frequent in highly populated areas and this often means cities – which have higher crime rates than the countryside. As for radios and correlation to mental illness, the study was carried out during a period of rapid societal change which would lead to the radio becoming a common household item and vast improvements in diagnosing mental illness. Thus, in all three cases, seeming correlation must in fact be explained by entirely different data.

**Final note on correlation/causality:** As any number of my colleagues delight in pointing out, it is a mainstay of the failings of the dismal science of economics that it is often impossible to actually definitely prove causality. Too often there are so many underlying and parallel variables involved that it becomes impossible to attribute (or even show) causality between a pair of variables. There are simply too many other possible influences to attribute a degree of causality to any one variable. I strongly recommend Chapter 4 “Where have all the criminals gone?” in the book *Freakonomics*, where the authors claim that the remarkable decrease in crime rates in the US during the 1990s had little or nothing to do with a “roaring economy”, harsher gun laws, increased use of the death penalty or new police strategies but was clearly linked to the famous US abortion law (*Roe v. Wade*) from 1973! The authors make a case that mothers who are socially disadvantaged – single parents with low income – are strongly correlated with having children turning to crime. The dramatic increase in abortions during the 1970s meant fewer births in the very social groups where children were at worst risk of becoming criminals. The effect of this was that by the time the early 1990s rolled around, there were far fewer early teens with the propensity to become criminals and the crime rate began to fall. I hasten to point out that the authors very quickly question their own results by stating the “…likeliest first objection…”, namely that there might NOT be causality but simply correlation. They then use several statistical methods to test their findings and indeed find causality.

---

**Definition: ‘Correlation’**

When there is a visible pattern between variables \((X, Y, Z…)\), one speaks of correlation. If \(\Delta X \uparrow\) and \(\Delta Y \uparrow\) there is positive correlation. If \(\Delta X \uparrow\) and \(\Delta Y \downarrow\) there is negative correlation.

**Definition: ‘Causality’**

When there is correlation and evidence that a change in one variable causes a change in another variable, there is causality, e.g. if \(\Delta X\) causes \(\Delta Y\).

**Definition: ‘Nonsense correlation’**

If there is correlation without causality, one speaks of nonsense or spurious correlation.

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**DEALING WITH EXAM QUESTIONS**

In data response questions you are often given tables, charts and diagrams. One neat way to show evaluation is to comment on any indications of correlation and causality. For example, in a set of time-series diagrams for an economy showing how export earnings \((X)\) have increased, inflation \((i)\) has increased and national income \((Y)\) (money value of all goods produced in an economy) has increased, one can use core economic theory to comment on the correlation and even causality: “…as export revenue is part of national income, increased exports cause an increase in national income and the increased demand for exports together with a causal link between income and consumption will drive up domestic prices in the economy, i.e. inflation rises…”

---

**Indexes**

An index is a very clever way of adjusting data so that it becomes easy to compare changes over time and/or between individual firms/industries/countries etc. Two of the main indexes you will deal with in economics are for inflation (the consumer price index, CPI) and comparisons of economic growth rates (increase in GDP) between countries. It’s worth knowing how an index is put together at the outset of studying economics, so here is a simple – and childish! – example.

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5 One of my favourite colleagues, L.M., has the occasional HL math lesson in my classroom. Once, I was having a rant about the Mexican traffic jams and the bungling traffic cops who showed up and actually made matters worse. L.M. said; “Matt, you’re confusing the causal flows! It’s not the traffic jam that causes the cops to show up – it’s the traffic cops showing up who cause the traffic jams!” I don’t win a lot of points with L.M.

6 *Freakonomics*, Levit, Steven D., and Dubner, Stephen J., 2005
In my childhood home in a place called Åkers Styckebruk, Sweden, there is a well-scribbled and well-hacked doorpost where countless children, grandchildren, friends, and neighbourhood kids have marked their height during the past 30 years. Careful scrutiny yields the name of my oldest friend, Guy, several times and quite frequently Amanda – his daughter. 

Tempus fugit and all that. Here’s what Amanda’s marks on the doorpost look like:

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Amanda's height</td>
<td>111 cm</td>
<td>114 cm</td>
<td>123 cm</td>
<td>133 cm</td>
</tr>
<tr>
<td>Change during period (i.e. growth)</td>
<td>Period 1 '96-'97 3 cms</td>
<td>Period 2 '97-'98 9 cms</td>
<td>Period 3 '98-'99 10 cms</td>
<td></td>
</tr>
</tbody>
</table>

Amanda is now in her 20s and I cringe every time I get a message from her on Facebook. Uncles really don’t want to know what those cute little girls turn into when they grow up.

If we want to compare Amanda’s growth rate to other kids over the same period of time, it’s easiest to index her growth. Using the first time period as the base year – the value that all coming values will be compared with – we calculate:

\[ \frac{\text{Height at } t_n}{\text{Height at } t_0} \times 100 \]

...where is the actual year and \( t_0 \) is the base year value. This gives us Figure 3.3 below.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Amanda's height – indexed (Jan 1996 as base year)</td>
<td>100</td>
<td>( \frac{114}{111} \times 100 )</td>
<td>( \frac{123}{111} \times 100 )</td>
<td>( \frac{133}{111} \times 100 )</td>
</tr>
</tbody>
</table>

Note that the rate of growth over the entire time period is 19.8 percent. However the percentage change between individual years is not a matter of deducting the index value of the previous year from the value of the year in question. For example, the percentage increase between 1998 and 1999 is not 9% (119.8 – 110.8)! Percentage changes is calculated by taking the change in index value and dividing by the original value. So the percentage increase between 1998 and 1999 is \( \frac{119.8 - 110.8}{110.8} \times 100 \). This gives us a 8.1% increase in height between 1998 and 1999.

Using Sweden’s GDP figures as a final example for the same time period we can calculate growth rates using both absolute values and then an index series:

\[ \text{Swedish Bureau of Statistics, at http://www.scb.se/templates/tableOrChart___26651.asp} \]
Applying the same methodology as to Amanda’s growth.

<table>
<thead>
<tr>
<th>Year</th>
<th>1996</th>
<th>1997</th>
<th>1998</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP for Sweden (SEK = Swedish crowns)</td>
<td>1,958 Billion SEK</td>
<td>2,002 Billion SEK</td>
<td>2,070 Billion SEK</td>
<td>2,143 Billion SEK</td>
</tr>
</tbody>
</table>

| Change during period (i.e. growth) | Period 1 ’96-’97 2.24% | Period 2 ’97-’98 3.40% | Period 3 ’98-’99 3.53% |

Figure 3.4 Economic growth rates for Sweden.

Example: period 2; \[\frac{2,070 - 2,002}{2,002} \times 100 = +3.40\%\].

Naturally the index series shows the same growth rates as when we use the absolute values. Again, the cunning thing about using indexes is that we can more easily compare Sweden’s growth rate over time and between, say, Sweden and the UK. I always urge my budding economists who write extended essays in economics to index data values in order to be able to compare more easily. One of my more recent essays dealt with the possibility of correlation between economic growth and quantity of marriages in a municipality. By indexing all values it became much easier to do an analysis of the strength of correlation.\(^{10}\)

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**Summary & revision**

1. Economists use lots of models. These are based upon observations of real life; data collection; correlation analysis; formulating hypotheses; and finally testing the model against reality.

2. **Correlation** means that two (or more) variables show a pattern. For example we know that there is negative correlation between the price of a good and the quantity sold over a period of time.

3. **Causality** means that there is correlation and also that a change in the value of one variable causes a change in the value of the other. If the price of ice cream decreases this will cause an increase in ice cream consumption.

4. When there is correlation but no causal relationship, one speaks of nonsense or “spurious” correlation. There is 100% correlation between eating food and dying (ultimately) but eating food does not cause death.

5. A very common method in economics to enable comparisons over time and between groups is to index all data. The base period or value commonly has the value 100 and all subsequent values of the index are in comparison with the base value.

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\(^{10}\) This is called regression analysis and is best done having a math teacher at your elbow or on speed dial. Incidentally, there is indeed correlation between economic growth and quantity of marriages! Positive or negative?!
Key concepts:

- **Definition and function of markets**
- **Law of demand and correlation between price and quantity demanded**
- **How individual demand comprises market demand**
- **Introduction to basic market model; downward sloping demand curve**
- **Movement along vs. shift of demand curve**
- **Non-price determinants of demand**

**HL extensions:**

- Linear demand function: \( Q_d = a - bP \)
- Shifting the demand curve, e.g. a change in “a”
- A change in the slope of the demand curve, e.g. a change in “b”

Definition and functions of markets

Pick up the morning paper and flip to the classified ads. ‘Used bicycle – call Adam.’ ‘Baby-sitter urgently needed! Call the Svenssons!’ ‘Kittens! Call Sandy.’ ‘Change money at Sami’s – no commission!’ All of these fictitious ads are examples of markets in action. In each and every case, there is something being offered or asked for. Any replies will thus show the flip side of the coin; someone who wants the good or someone who can supply the good.

Markets are well-established institutions and operate at all levels of human interaction. When one thinks of ‘markets’, one often envisions stalls in an open square where goods are put out for sale and potential customers meander looking and perhaps buying. This traditional market place is a brilliant example, as all the necessary prerequisites are in place; there are numerous buyers (or customers) and numerous sellers (suppliers). Many of the stalls will have similar goods and similar prices yet many people will still circulate in the market, perhaps foregoing the wares offered at one stall in order to look at the same goods at another. Is that haggling I hear?! ‘One dinar for this?! How about two dinars for three?!’

Syllabus section 1 (Chapters 4 to 35) deals with how markets attempt to solve the basic economic problem. Consumers’ wants are paired-off with firms’ ability to satisfy those wants, creating the keystone of economic analysis: the supply and demand model. Then we look at market failings such as over-consumption or under-consumption of goods such as tobacco and health care respectively. Higher level students will then go into greater depth concerning market outcomes and the decision-making process within firms in ‘Theory of the Firm’.
**Definition: ‘Markets’**

A market is a situation where potential buyers are in contact with potential sellers. It enables the needs and wants of both parties to be fulfilled whilst establishing a price and allowing an exchange to take place.

Cut to an air-conditioned office equipped with wall to wall computer screens and phones. 30 young men and women are glued to the screens – all the while talking in to multiple phones and feverishly taking notes. Cyber-dating? Nope. Just another day in the life of («blip» and AUD$250,000 were just transferred to Tokyo) a foreign currency exchange office.

You get the picture. An example could be from yesterday or from the Vikings celebrating their successful invasion of York in 866; “Yah, Sven, plenty women to kill and cattle to rape! I’ll trade you one ox for two women.”

A more recent example is from any modern financial institution dealing with international buying and selling of currencies on the Forex (foreign exchange) market. The only real difference between the two markets’ structures is that the buyers and sellers of currencies are not in physical contact with each other – and also that the Australian dollar is not bought at the business end of a 4.5 kilo broadsword.

**Market types**

In the description of markets above it is implied that there are a number of firms competing on the market for goods and services. While this is often enough the case, there are a number of instances where the degree of competition is considerably lower, for a number of reasons. The competitive market has many firms and a high degree of competition, whereas a monopoly is at the other extreme; a single powerful firm and no competition. In between there is a ‘large fuzzy grey area’ where we find markets characterised by a few large firms – oligopoly – and high profile firms characterised by heavy advertising and brand-imaging – monopolistic competition. The following figure arranges these four market structures according to four sets of criteria. (For greater depth on market structures – even for the ambitious SL student! – see chapters 22 – 35.)

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1 Or something to that effect. They weren’t too brainy those Vikings. Too much salted herring.

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**Figure 4.1 Market structures and their characteristics**
The four criteria in Figure 4.1 above are in fact used as assumptions, as we are defining the market structure by assuming that certain traits are fulfilled. The size and number of firms has a powerful influence on the level of competition and price, and therefore the power of the firm relative to the consumer. Many firms will mean more competition and vice versa. The greater the number of firms that compete, the less power any individual firm will have over market prices.

**Barriers to entry** mean that it is difficult/costly for potential newcomers (firms) to enter the market. High barriers to entry are mainly of three types:

1. **legalistic** (for example the restrictions and regulations governing banks and airlines, or not having certain patent rights necessary for production);

2. **financial** (including difficulties in getting the funding together to start a railroad company, or not having access to raw materials); and finally

3. **economic** (newcomers would be producing small amounts which will mean high cost per unit whereas existing firms would have much lower costs). The various forms of entry barriers compound the question of competition, as high barriers to entry will allow existing firms to act without giving too much consideration to the possibility of firms entering the market and increasing competition.

The degree of homogeneity and heterogeneity defines the composition or make-up of the good. Homogeneous means ‘same’ or ‘identical’ and in economics signifies whether a good has any number of identical (or close) substitutes or not; the potato is an oft-cited example. Heterogeneous is of course the opposite; a good which is differentiated (= set apart, non-homogeneous) from possible substitutes. It is relevant to note that goods do not actually have to be physically different – it is sufficient for us to perceive that goods are different – there are many Taco restaurants but only one Mama Rosita’s! (See monopolistic competition below.)

Finally, there is a question of the relative bargaining power of consumers and firms. If consumers have a good deal of influence on prices and output, then consumer sovereignty is high. One would indeed expect to find this in competitive markets where there are many firms. If, however, there is only one firm (supplier) then there are no substitutes available and consumer sovereignty will be low. Regarding the empowerment of consumers as the ability to ‘cast votes’ on goods, then a competitive market will empower consumers more than non-competitive markets.

The shading in Figure 4.1 is not by accident. If you look at the characteristics of the perfectly competitive market and monopoly, you will see that they are each others’ opposites, being basically two extremes. Oligopolies and monopolistically competitive firms, on the other hand, portray very little correspondence in terms of neatly following the arrows separating the two extremes. This ‘fuzzy grey area’ is the most difficult to characterise accurately and unfortunately this is the area most of the real world winds up in. Also, don’t be fooled by the neat figure; in reality there is a great deal of overlapping, where an oligopoly is monopolistically competitive and could also have elements of monopoly markets embedded. An example would be Microsoft, Macintosh and Linux operating systems.

**Perfect competition**

A perfectly competitive market is characterised by many buyers and many sellers, all interacting in such a way so as to provide the highest possible quantity at the lowest possible price. As the goods are assumed to be 100% homogeneous, the only competitive element is price-competition, which in turn empowers consumers and the market is demand-driven. In providing this outcome there is no waste – all goods are produced in order to fulfil market demand. This optimum outcome in terms of resource allocation is what is ‘perfect’ about the market structure. Agricultural goods like tomatoes and coffee and basic commodities such as iron and copper could be considered perfectly competitive market goods. The remaining three market structures are commonly referred to as ‘imperfect competition’.

**Oligopoly**

The main defining elements of an oligopoly are ‘few’ and ‘large’ – where there could well be several hundred firms but four or five firms dominate the market. The dominant firms in an oligopolistic market structure might have access to limited raw materials, such as bauxite (for aluminium) and oil, creating entry barriers for other potential firms. Firms are often large because of the necessity to produce very large quantities of goods to cover high costs of production and research and developments (R & D) – such firms are said to enjoy benefits of scale (scale means size) where the cost per unit of output falls as the firm increases in size. Examples of such oligopolies are pharmaceutical and car companies. There is also an incentive for firms to collude (= cooperate), for example by agreeing to
Monopolistic competition

This is an increasingly common market structure where there are a large number of firms producing similar goods which are differentiated. The defining elements of monopolistic competition are taken from perfect competition and monopoly – hence the name. The market is competitive as entry barriers are low and potential firms will have access to attractive markets. The market is also monopolistic, as goods are highly profiled – firms put a great deal of resources into marketing in order to convince us that while there are many possible substitutes, there is only one ‘Brand X’. This is known as branding and serves to create in the mind of the beholder that a particular good or service is in some way different - e.g. superior - to others. Standard textbook examples of monopolistically competitive firms are restaurants, hotels, car repair services and bakeries. One also often finds a number of markets which are largely monopolistically competitive but where there are a few large, dominant firms; the markets for sports shoes and soft drinks are notable examples. In reality therefore, the line between monopolistic competition and oligopoly is often blurred.

Monopoly

Finally, the far end of the spectrum. Here the assumption in economic theory is that there is one firm only – a pure monopoly. Examples of pure monopoly markets are postal services, state television and even oil companies (Pemex in Mexico) as seen in many countries. The concept of a pure private monopoly doesn’t stand up to scrutiny in the real world particularly well and I’d be hard put to find a specific example.2 The definition of monopoly is a tricky one since it often depends on the definition of the market in terms of both product and geographical area. Hence, de Beers might be considered a monopoly (see footnote below) in the supply of raw diamonds but not in the market for diamond jewellery. Geographically speaking, local gas, water and cable companies can have a regional monopoly but not on all gas, water and TV/internet services in the country. The definition becomes a question of the degree of market power for the firm, i.e. that monopoly firms have market power at the expense of consumers as there are no close substitutes and thus scant competition. Firms have the power to set output and price without taking competitive forces into consideration. In the final analysis, consumer sovereignty in a pure monopoly situation is a bit like voting in the ex-Soviet Union; everyone could vote freely but there was only one party.

Law of demand

Part of the economic problem is that people have endless wants. However, simply wanting or desiring a good does not constitute demand. Demand is more an activity than a state of mind, e.g. when you are actually willing to purchase a good at a certain price. Demand in market terms is the quantity consumers are willing and able to buy at a given price, not what they would like to have. I would most assuredly want a Patek Phillipe wristwatch but I am not in the market for one (yet if you bought this book I’m getting there). When consumers are both able and willing to buy a good, economists speak of effective demand.

Recall from Chapter 3 the issue of correlation and causality. If we plot out effective demand for a normal good with price on the Y-axis and quantity demanded on the X-axis, we would see negative correlation: when the price of a good falls the quantity purchased of the good will increase. The starting point for our model of demand is positing (= proposing) that a rise in the price of a good will lead to lower quantity demanded for the good – keeping all other variables constant. This is the law of demand, which states that ‘Ceteris paribus’, a change in price will lead to a change in the quantity demanded.

Definition: ‘Law of demand’

Ceteris paribus, a fall in the price for good X will result in an increase in the quantity demanded for good X. An increase in the price of X will result in a decrease of quantity demanded.

The law of demand states that as long as all other variables (income, price of other goods, preferences) remain unchanged, then a fall in the price of a good will lead to an increase in the quantity demanded. This means that the demand curve is downward sloping and thus that quantity demanded is negatively correlated with price.
In scientific research in general and economic models in particular, one builds a model knowing that there are many possible influences on the relationships one is looking at. In using our demand model to look at the effects of a change in the price of, say, gasoline (petrol), we would assume that a number of other influences on gasoline consumption would be kept constant. Consumption of gasoline would be correlated to several non-price determinants, such as households’ income, the average price of cars (complement goods), the average price of public transport and so on. Assuming that there is no change in income, car prices or public transport, we would see that a fall in the price of gasoline would lead to an increase in gasoline consumption.

The assumption of *ceteris paribus* – ‘all else equal’ – is almost always present in our economic models. It is virtually impossible to leave out of our models as it raises the level of scientific trustworthiness by creating a more rigid framework of deductive reasoning, e.g. that a change in ‘X’ will lead to a predictable change in ‘Y’ as long as the situation is not muddied by an infinite number of other possible influences.

**Definition: ‘Ceteris Paribus’**

*Ceteris paribus* is Latin and means “…all else remaining equal…” or “…all other things remaining the same….” This essential assumption allows economic models to predict outcomes and relationships with a degree of certainty and conviction simply by assuming that variables not addressed in the model are kept constant.

Individual demand and market demand

One of my favourite movies as of late is *Despicable Me* which at the time of writing has just left the big screen and hit DVD/Blu-ray. I missed it on the big screen so, like a goodly many of my students, I bought it on DVD. My students and I all have our individual demand for DVDs and the sum of all demand here in Mexico City makes up the market demand. In other words, any market demand is simply the aggregate of individual consumers’ demand for the good. It is noteworthy that individual buyers can be Matt and his students (consumers), Wal-Mart (other firms) and the Naucali Youth Centre (government).

If we hugely simplify the market and look at a small market consisting of three IB students and their demand for DVDs over a week, we get Figure 4.2 below. (MXN = Mexican pesos)

The market demand curve in this very simple example is made up of the three consumers which all have an effective demand for DVDs; Maria, Ana and Jesus. In keeping with the law of demand, we see that a lower price will mean greater quantity of DVDs purchased each week. At a price of MXN150, the three consumers will purchase a total of 8 DVDs per week – which is market demand (D_{mkt}). At a price of MXN50 market demand is 24 DVDs per week.\(^5\)

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3 Pause here for groans from my students...”...Matt, all your movies are favourites!” Yes, so?

4 I saw it on a long distance flight from Hong Kong at 03:00 in the morning. I am sure the other passengers found my screams of laughter very amusing.

5 Yes, I know this is hideously simple. When I explain this the first time in class, there’s always one of my kids who goes “Duh!” However, keep in mind that the Maria’s, Ana’s and Jesus’ weekly allowance doesn’t change...nor does the price of movie tickets...nor does the price of DVD players...nor anything else which would affect weekly DVD demand of my students.
In essence, we are painting a picture of the pattern of demand for a good, where all possible prices are coupled to the quantities demanded. This gives us any number of possible combinations of price and quantity demanded of DVDs, but for the sake of simplicity in Figure 4.3 below only three prices are mapped out. There are two reasons for an increase in quantity demanded when the price of a good falls; the income effect and the substitution effect.

- **Income effect**: If your income remains the same but prices rise, your real income has decreased and consumers would have the propensity (= tendency) to decreases their purchases of the good. In the same way, a fall in the price of a good means that people who have a demand for the good are now richer in real terms, i.e. their income in terms of how much they can actually buy has increased – they buy more. If – *ceteris paribus* – the price of DVDs falls from MXN100 to MXN50 the quantity demanded increases from 16,000 DVDs per week to 24,000.

- **Substitution effect**: Secondly, a fall in the price of a good means that relatively speaking the price of alternative goods has increased, so people will change their purchasing behaviour and switch some expenditure to the (relatively) less pricey good. In simple terms, consumers will substitute other goods with the lower priced good. Thus, if the price of DVDs increases from MXN100 to MXN150 then consumers will, to a certain extent, switch to substitutes (say cinema tickets or Blu-Ray discs) since these substitutes are now relatively cheaper – quantity demanded falls from 16,000 DVDs per week to 8,000.

**Figure 4.3: Market and downward sloping demand curve**

**Movement along vs. shift of demand curve**

In Figure 4.3 above, assume that the initial price is MXN100 and thus that quantity demanded per week is 16,000 DVDs. If the price increases to MXN150, then the quantity demanded falls from 16,000 DVDs per week to 8,000. This is shown by a movement along the demand curve, from point A to B, which means, using correct economic terminology, that ‘…the quantity demanded decreases.’ A decrease in the price from MXN100 to MXN50 is a movement along the demand curve from point A to C – the quantity demanded has increased from 16,000 DVDs per week to 24,000. The demand curve extends or contracts, i.e. any movement along the demand curve can be referred to as an extension/contraction of demand. The curve is actually created by all the combined points of price and quantity demanded.

A few comments on the simple relationship in Figure 4.3:

1. The relationship between price and quantity demanded is negative; any downward sloping curve shows that an increase in one variable (price) leads to a decrease in the other variable (quantity) which is entirely in keeping with the law of demand. Note once again that in “moving along” the demand curve we are assuming that all other influences on demand are held constant, e.g. the *ceteris paribus* condition.
2. Have you noticed that we have put the independent variable on the ‘wrong’ axis?! The norm is to put the independent variable on the X-axis and the dependent variable on the Y-axis. As quantity is undoubtedly the dependent variable, we have ‘switched places’ in our model.

3. It is most important to keep firmly in mind that there is a time-frame involved, here ‘1,000s of DVDs per week’. Economists are notoriously sloppy and lazy for some reason when it comes to including this rather important premise, and I urge you to include the time element in your own diagrams. Not having a time frame (i.e. a time limit) would basically mean that the demand curve is set in stone for all eternity! It is not; the demand curve is, as we shall see, most dynamic over time.

### Shifts in the demand curve

As will be explained in some depth below, any change of the determinants of demand other than price, will serve to shift the demand curve.

![Diagram of demand curve](image)

**Figure 4.4: Market and downward sloping demand curve for DVDs**

In Figure 4.4 above the original demand curve is $D_0$. If incomes increase (for those who are part of effective demand) we would see that demand for DVDs increases at all price levels – this is shown as a rightward shift in the demand curve from $D_0$ to $D_1$ and referred to as an *increase in demand*. Conversely, if the price of Blu-ray discs were to decrease, then some consumers would switch some expenditure to Blu-ray discs (a substitute) and the demand for DVDs would decrease at all price levels – the demand curve shifts left from $D_0$ to $D_1$. This is a *decrease in demand*.

---

**Exam tip; using the language of an economist**

Ever wondered about the language that language teachers insist upon using? Me neither. Rather than saying ‘do-words’ they say ‘verbs’; rather than ‘thing-words’ they say ‘nouns’. They have an entire menagerie (= collection) of terms that could just as soon be said in Martian as far as I’m concerned. Unfortunately, economists are no different – something I will never admit to the face of a language teacher. We have an immense array of very subject-specific terms and concepts. The successful economics student must incorporate them into his/her active vocabulary. Distinguishing carefully between ‘change in the quantity demanded’ and ‘change in demand’ is an excellent place to start.

Any change in the price will result in an increase or decrease in the quantity demanded. An increase or decrease in price means a movement along the demand curve. This is referred to as a change in quantity demanded.

- changing the price does not change demand but the quantity demanded
- a change in the quantity demanded is a movement along the demand curve

Any change in a non-price variable will cause an increase or decrease in demand at all price levels. An increase or decrease in demand means a shift of the demand curve. This is referred to as a change in demand.

- changing a non-price variable (income, price of other goods…etc) does not change quantity demanded but demand
- a change in demand is a shift of the demand curve

---

6 This is the fault of one of the most influential textbook authors in economics, Alfred Marshall (1842 – 1924). The story has it that he simply made an error – which has stuck with us ever since!
Non-price determinants of demand

In the coming model, a fundamental premise is that demand is a function of many different variables, the main determinant being the price of the good. All other influences are non-price determinants of demand which will shift the demand curve, the main ones being:

1. **income** of consumers
2. **price of other goods** (substitutes and complements – more on this later)
3. changes in consumers’ tastes/preferences
4. changes in consumers’ expectations/hopes
5. population changes – both in terms of size and structure
6. derived demand – e.g. where the demand for cars creates demand for steel

**Definition: ‘The demand function’**

\[ Q_{dx} = \int P_x; P_y; Y; \ldots \text{n} \]

The demand function reads “The demand for good X is a function of 1) the price of good X; 2) the price of good Y (substitute or complement); 3) income (Y); 4) n – being tastes, population…etc. Our diagrammatic analysis links the price to quantity.

This book doesn’t permit going into the other 1,800 possible influences on demand. Let us look at the six non-price determinants above using a few real-world examples. Note that in using the demand model, actual quantities and prices are seldom used. The diagrams serve as illustrations rather than real-life depictions of actual data.

**Income**

It cannot come as a surprise that an increase in income would increase demand for a good. Just recall that our wants are endless! Thus, any furthering of the ability to satisfy those wants will mean that people will have an increased tendency to do. When demand increases for a good due to an increase in income, economists commonly refer to such goods as ‘normal’ goods. (See income elasticity in Chapter 11.)

I do two weeks of teaching at the Oxford Study Courses in England every Easter. The first time I did this I flew via Stanstead Airport, which is a small and somewhat basic airport unlike the larger Heathrow or Gatwick Airports. On returning home I told my then wife that we were lucky that I flew via Stanstead, as the wages I’d been paid were burning a hole in my pocket; had I flown via Heathrow I probably would have spent the entire week’s wages at the Tax Free shop on a new watch. Sad but true. So, did I then save my increase in income? Nope. I was surfing the Internet for Blancpain watches that very evening.

---

8 Basically, I’m greedy – and Blancpain watches aren’t given away.
9 I seem to collect not only wrist watches but ex-wives. One of my cheekier students plotted out my marriage habits and then correlated my ups and downs with the business cycle. She found correlation – the regression coefficient was 0.35! Maybe you should write me and ask about my marital status before buying any shares or property… Hmm, good extended essay material here. Write me and I’ll send you the data.
What might cause an increase in general incomes in an economy? Perhaps a decrease in income taxes leaves people with higher disposable incomes. Or general increasing prosperity gives the people in an economy higher wages and thus incomes. In any event, an increase in disposable income, (= income after taxes and including any welfare benefits and such), will increase the demand for normal goods. In the example of Swiss watches, this will cause a shift in the demand curve to the right, from $D_0$ to $D_2$ in Figure 4.5, i.e. more watches are demanded at all prices. (SFR = Swiss francs.)

I’d best add a brief note on ‘abnormal’ behaviour within the context of the income effect. The goods exemplified above are normal goods as the norm (= custom) is for demand to increase when income rises. However, it is possible that demand for some goods might actually fall when incomes rise simply because a rise in income will change households’ preferences – increased income could cause households to substitute certain goods with other, more preferred goods. Such goods are called inferior goods, possible examples of which are public transport and potatoes. We return to this issue in Chapter 11.

Price of other goods

Substitute goods: When two goods are in competitive demand they are said to be substitutes – and thus a rise in the price of one good would cause an increase in demand for a substitute. There are a number of new formats for recording and viewing movies at home, the most recent are the formats Blu-Ray and HD DVD which look to compete with the standard DVD system.\(^{10}\) When one looks at these products, they are obviously competitors for my money. Should the price of Blu-Ray players increase there will be an increase in demand for Blu-Ray players ($D_0$ to $D_2$ in Figure 4.5) Note that, once again, we are assuming all else equal, i.e. there is no change in the quality or function of either good. Consumers are simply substituting one good with another.

Other examples of substitute goods are rail travel and bus travel, apples and pears, or, to be most product-specific, Pepsi and Coke.\(^{11}\) (Many textbooks give tea and coffee as examples, which I find to be utter nonsense – but then I am heavily addicted to coffee. Nothing substitutes coffee in my book.) A recent example of the power of substitutes arose in 2010 when demand for US grain rose more than 14% due to drought and subsequent price increases in two of the largest grain producing countries, Russia and Ukraine.\(^{12}\)

Complement goods: Now, how would one go about buying one of the DVD or Blu-Ray players? Being an economist, you would look at the total (“bundle”) price of usage, in other words the price of the player and the discs – either for recording or playing. These two goods are in joint demand, commonly referred to as complement goods. The two are a ‘package deal’ basically, as one is useless without the other. Being complementary to each other, a change in price of one good will affect demand for the other. Should Blu-Ray discs increase substantially in price, one can expect demand for Blu-Ray players to decrease ($D_0$ to $D_1$ in Figure 4.5).

Other standard examples of complement goods are tennis balls and tennis racquets, film and cameras, and staples and staplers.\(^{13}\) Note that all complement goods are often not as ‘joined-at-the-hip’ as my example, but are as often as not quite weakly connected via preferences and habits.\(^{14}\) I often give the examples of Cognac and cigars, strawberries and cream, and mustard and pea soup. I bet that last one caught your attention. Yes, in Sweden

\(^{10}\) I actually wonder if Blu-Ray will take off – the picture is too good! A goodly number of my students agree that the picture sharpness is a bit staggering. I think my initial comment was something like “It’s too real...like viewing the world sober. I’m not sure I need more reality.”

\(^{11}\) My students disagree with me most adamantly here! Me, I failed the ‘Pepsi Challenge’.

\(^{12}\) “Wheat, Corn Stockpiles Dwindle After Russia’s Drought” BW 25 – 31 Oct, 2010

\(^{13}\) How about tequila and writing economics?! Try reading the footnotes….

\(^{14}\) Here in Mexico, a bill clip holding one’s driving license and a 100 peso note (circa USD9) are complement goods – if you need to show your license to one of Mexico’s finest you’ll also need a “mordida”, i.e. a bribe to get you on your way. Commonly the license and the bill are handed over together. Also, drinking and driving are not substitutes but complements. This is the sort of comment that apparently caused my colleagues to start betting on my life expectancy here. Nobody has me down for more than four years. When the colleagues say goodbye to me on Fridays, they say it with depth and mean it.
one customarily puts a dollop of mustard in one’s bowl of pea soup. I added this example to illustrate the cultural dimension of many complement goods – just think of French fries with ketchup (USA), French fries with vinegar (England) and French fries with mayonnaise (Belgium). Here in Mexico, lime juice is a complement to…well, anything in the way of food!

Tastes and preferences

“The Atkins diet was a nightmare for the consumer, but also for us.” (Guido Barilla, chairman of Barilla Pasta, Economist, Jan 20th 2007)

Consumers are often persuaded to buy certain goods by peers, fashion and advertising – and I’d hate to say which of these is the strongest in terms of the Atkins diet. What if we instead look at the amazing life expectancy of the Greeks who have one of the highest average life spans in Europe – in spite of having one of the highest European proportions of smokers in the population and one of the lowest levels of physical exercise! The answer, according to research, lies in the use of healthy olive oil. A successful advertising campaign would increase demand for olive oil, shifting the demand curve to the right (D₀ to D₂ in Figure 4.5). Our tastes can also change as the result of intellect rather than emotions; cigarette smoking is declining in most developing countries as the health issues become better known.

Expectations

The strength of expectations is difficult to overestimate. So much of our behaviour is directly related to what we hope/want to happen. Just imagine how house buyers would react if a major highway were to be built right through the neighbourhood they were looking at. Demand for the houses would drop like a paralysed parakeet due to the expectation of falling future property prices.

Any time people expect things to happen within a foreseeable future time period, demand will be affected. If future prices are expected to rise, peoples’ present demand might rise; if the future value of shares on the stock market is expected to rise, speculators’ present demand for shares might rise; and if taxes on property are expected to fall in the future, present demand for property might rise. A recent example of speculatively driven demand is the price of guns in the US during 2009 due to expectations that President Obama was going to pass stricter legislation on arms sales. An extreme example of the power of expectations occurred in Japan during the autumn of 2010 when the government passed laws for much higher taxes on cigarettes and Japanese smokers hoarded billions of dollars worth of cigarettes before the tax hike came into effect. This actually had an effect on national income – perhaps adding as much as 1.4 percentage points to national income.

Please note that expectation is one of many possible variables which will have an impact on demand. Expectations are noteworthy in the light of stock market downturns during 2008/9. It doesn’t require a degree in rocket surgery to understand that when people expect certain things to happen in the future, it can well affect their demand in the present. As house buyers saw prices fall they held off on new house purchases – which led to a decrease in demand. This has led to a ‘self-fulfilling prophecy’. As housing prices fell, people expected this to continue. As consumers waited for a further fall in prices they actually held off on new housing purchases. This meant that demand fell... and that prices fell as an effect! This self-reinforcing negative feedback loop has proven immensely powerful for overall demand in the US economy since so much of household wealth is tied to property. As (perceived) wealth of home-owners declines, so too will demand for goods.

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Population size and structure

An increase in population causing an increase in demand should be relatively plain. Yet there are also demand changes caused by a change in the structure of the population. For example, increased immigration will change the demand for certain types of food; age structure will change the demand for goods such as baby food or pensioners’ homes; income and wealth re-distribution in a country will affect demand for income sensitive goods, and so on.

Derived demand

When demand for a good, say cars, increases then factor inputs such as steel will see an increase in demand. We say that the demand for steel is derived from the demand for cars. Derived means ‘to be based on’ or ‘have its source in’. The concept is rather useful in understanding the interrelationship between goods that don’t fall precisely into the category of complement goods. Derived demand is commonly associated with production, where firms using any number of products as inputs will affect demand for said inputs. Continuing with the example, car manufacturers use steel, rubber, plastic, glass…etc. A fall in the demand for cars will affect car manufacturers’ demand for all of these inputs. During 2009/’10, rampant increase in Chinese demand for copper and iron from Australia and Brazil led to increased demand for Caterpillar mining machinery from the US manufacturer – a clear example of derived demand.22

One of my favourite examples of derived demand is currency, say the Namibian dollar, the demand for which is derived from the demand for tourism in Namibia; demand for Namibian exports; and the demand for investment in Namibia. Note that the causal flows can be reversed! Here in Mexico we receive a great deal of American tourists and when the US dollar appreciates (= increases in value compared to the Mexican peso) American tourists get more pesos for their dollar. Consequently, the US demand for hotels in holiday resorts such as Acapulco increases.

Putting the pieces together; oil and silicon

During 2007 and 2008, several economic commentators noticed how the increase in oil prices led to an increase in demand for silicon. Confused? It’s really quite simple and deals with some of the issues outlined above, namely substitutes and derived demand.

- As the price of oil increased dramatically, households started to look to possible substitutes.
- Oil is used in many industries, one of which is energy. As energy costs for households rose, possible substitutes became more and more economically viable (= possible).
- One of the substitutes for oil in the field of energy is solar power. Thus, demand for solar panels increased drastically…
- …and since silicon is used in the manufacturing of solar panels, the derived demand for silicon rose and led to a tenfold price increase during 2007/2008.

On a personal note, I saw the writing on the wall early on in 2007 and bought shares in Vesta, a Danish company manufacturing wind power generators. Sometimes you win. Then oil prices fell drastically during 2009 and these shares bombed. Sometimes you lose.

---

22 “Stocks, copper rise, Treasuries drop..”, Business Week 1 Sept 2010
HL extensions

In this HL section you will address a simple linear demand function and learn how the demand curve shifts and changes slope.

Linear demand function \( Q_d = a - bP \)

The demand curve plots out how a change in price causes a change in the quantity demanded. Since the demand curve is downward sloping, price and quantity are negatively correlated. We shall use the following form for our demand function:

\[ Q_d = a - bP \]

- **Qd**: quantity demanded
- **a**: is the autonomous level of demand (e.g. unrelated to price changes) – this is the Q-axis intercept
- **b**: is the responsiveness of consumers to a change in price – this is the slope
- **P**: price

We basically see that Qd is a function (‘a result of a change in’) the price of the good; \( \Delta P \rightarrow \Delta Q_d \). Assume that our D function is \( Q_d = 4,000 - 20P \):

- At \( P(0) \) Qd will be 4000 units
- At \( P(200) \) Qd is zero units

It is conventional in Economics to plot Q (supply) on the horizontal and P (price) on the vertical axis. To meet with the mathematical conventions of graphing functions, we will quote each function as a ‘P =’ function as well as a ‘Q =’ function so that the slope may defined in the usual way as ‘rise over run’.

Thus the demand function of this example:

\[ Q_d = 4,000 - 20P \]

may be transposed:

- \( 20P + Q_d = 4,000 \) (by adding 20P to both sides)
- \( 20P = 4,000 - Q_d \) (by subtracting Qd from both sides)
- \( P = 200 - \frac{1}{20}Q_d \) (by dividing both sides by 20)

Using conventional mathematical theory, the slope of this curve is \( -\frac{1}{20} \) meaning that for every increase in Q of 1 unit, there is a reduction of price of \( \frac{1}{20} \) (or an increase of 1,000 in Q results in a $50 reduction in price.

![Graph of Linear Demand Function](image)

**Figure 4.6**
Shifting the demand curve

Recall that our demand function is $Q_d = a - bP$. Any change in a non-price will shift the demand curve. Assuming that demand increases, this in fact means that quantity demanded increases at all price levels. This is a change in autonomous demand (‘a’).

Assume that the new D function is $Q_d = 5,000 - 20P$ …

or $P = 250 - \frac{1}{20}Q_d$

- At $P(0)$ $Q_d$ will be 5,000 units
- At $P(250)$ $Q_d$ is zero units

Note that every incremental increase in price of $50$ still leads to a decrease in $Q_d$ of 1,000 units – e.g. the slope has not changed.

Changing the slope of the demand curve

So, our original demand function is $Q_d = a - bP$ which is $Q_d = 4,000 - 20P$. If the slope changes from 20 to 15, e.g. $Q_d = 4,000 - 15P$ …

- The slope becomes steeper
- The D-curve will intercept the P-axis at….

Changing the slope from 20 to 15

<table>
<thead>
<tr>
<th>$P$</th>
<th>$Q_d$</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4000</td>
<td>$Q_d = 4,000 - 15P \cdot 0; 4,000$</td>
</tr>
<tr>
<td>50</td>
<td>3250</td>
<td>$Q_d = 4,000 - 15 \times 50; 3,250$</td>
</tr>
<tr>
<td>100</td>
<td>2500</td>
<td>$Q_d = 4,000 - 15 \times 100; 2,500$</td>
</tr>
<tr>
<td>150</td>
<td>1750</td>
<td>$Q_d = 4,000 - 15 \times 150; 1,750$</td>
</tr>
<tr>
<td>200</td>
<td>1000</td>
<td>$Q_d = 4,000 - 15 \times 200; 1,000$</td>
</tr>
</tbody>
</table>

---

23 Stick in $Q_d = 0$ into the formula; $Q_d = 4,000 - 15P \rightarrow 0 = 4,000 - 15P \rightarrow 4,000/15 = 266.67$
If demand decreases and the slope also decreases…

- The new function is \( Q_d = 3,000 - 30P \) (\( P = 100 - \frac{1}{30}Q_d \))

Any change in a non-P variable can affect both ‘a’ and ‘b’ in the D function

- A change in ‘a’ means that demand has changed … (i.e. a change in a non-P variable!)
- And a change in ‘b’ means a change in the responsiveness to a change in price (as in slope)

<table>
<thead>
<tr>
<th>P</th>
<th>Qd Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>( Q_d = 3,000 - 30 \times 0; 3,000 )</td>
</tr>
<tr>
<td>50</td>
<td>( Q_d = 3,000 - 30 \times 50; 1,500 )</td>
</tr>
<tr>
<td>100</td>
<td>( Q_d = 3,000 - 30 \times 100; 0 )</td>
</tr>
<tr>
<td>150</td>
<td>( Q_d = 3,000 - 30 \times 150; -1,500 )</td>
</tr>
<tr>
<td>200</td>
<td>( Q_d = 3,000 - 30 \times 200; -3,000 )</td>
</tr>
</tbody>
</table>

Any change in a non-P variable can affect both ‘a’ and ‘b’ in the D function

- A change in ‘a’ means that demand has changed … (i.e. a change in a non-P variable!)
- And a change in ‘b’ means a change in the slope of the demand curve (this is related to the sensitivity of the good in terms of a change in price – see price elasticity of demand in Chapter 9)

![Figure 4.8](image)

**POP QUIZ 4.1**

Note that calculations such as you will do in supply and demand will return several times in later sections.

1. Assume a demand function of \( Q_d = 200 - 2P \). This tells us that:
   i. The Q-intercept, ‘a’, is 200 units
   ii. The P-intercept is ‘a’ / ‘b’; 200/2 = $100
   iii. The slope is 2; for each $1 increase in price, Qd decreases by 2 units

2. Make a simple table showing the Qd when P=200, 150, 100, 50 and 0.

3. Illustrate these values (pairs) in a diagram, e.g. draw a demand curve.
Markets and Demand

4. Draw a new demand curve based on the price of a complement decreasing – this leads to a 20% change in demand for our good but no change in slope.

5. Draw another demand curve in the same diagram showing that the price sensitivity of the good increases, e.g. the slope changes. For each $1 increase in price, the Qd decreases by 3. (Q-intercept remains unchanged.)

Summary & revision

Demand

1. Markets are a very efficient way of satisfying wants/needs in society and allocating resources via the price mechanism.

2. Four main market types are identified:
   a. Perfectly competitive markets – many small firms producing homogeneous goods and low barriers to entry for other firms
   b. Oligopoly markets – a few large firms dominate the market where entry barriers are high
   c. Monopolistic competition – many firms compete on a market with relatively low barriers to entry for differentiated (branded) goods
   d. Monopoly – one firm controls the market and barriers to entry are very high

3. Law of demand: an increase in the price of a good – ceteris paribus – will lead to a decrease in the quantity demanded

4. Ceteris paribus: all else equal, nothing else changes

5. Effective demand: the quantity of a good consumers are willing and able to purchase at different prices during a given time period

6. Individual demand: the willingness/ability of an individual consumer/firm to buy goods at different prices during a period of time

7. Market demand: sum of all individual demand

8. Downward sloping demand curve has two causes:
   a. Income effect – a decrease in the price of a good means real income rises for consumers who then can buy more of the good
   b. Substitution effect – a decrease in the price of a good (ceteris paribus) means that the relative price of substitutes has risen so consumers substitute a quantity of other goods for the lower priced alternative

9. A change in price leads to a movement along the demand curve

10. A change in a non-price variable affecting demand leads to a shift in the demand curve

NOTE:

This and several subsequent chapters refer to plotting graphs and finding their slope. This topic is covered in more detail in a free downloadable set of resources. To get these, go to the author’s website http://www.goodbadecon.com/

The resource can be found under ‘Slope’.
Section 1.1 - Chapter 5

5. Markets and supply

Key concepts:
- Law of supply and correlation between price and quantity supplied
- How individual firms’ supply comprises market supply
- Introduction to basic market model; upward sloping supply curve
- Non-price determinants of supply
- Movement along vs. shift of supply curve

HL extensions:
- Linear supply function; $Q_s = c + dP$
- Shifting the supply curve, e.g. a change in “$c$”
- A change in the slope of the supply curve, e.g. a change in “$d$”

Law of supply

One of the hippie credos of my troubled childhood was the T-shirt legend, ‘What if they gave a war and nobody came?’ This is like saying that a good has been provided but there is no demand for it whatsoever. There is no such thing; in order to be able to refer to a market, there have to be both willing buyers and willing sellers. One might actually say that demand creates supply.

The supply curve operates along the exact same parameters as demand. A change in price will – ceteris paribus – result in a change in the quantity supplied. As in the pattern of demand, there is clear correlation as long as other influencing factors remain the same. This is the law of supply, and differs from demand in having positive correlation – when the price rises, ceteris paribus, the quantity supplied increases and vice versa.

Definition: ‘Law of supply’
“Ceteris paribus, a rise in the price for good X will result in an increase in the quantity supplied of good X. A fall in the price of X will result in a decrease of quantity supplied.”

The law of supply states that as long as all other variables (the cost, availability and quality of factors of production) remain unchanged, then a rise in the price of a good will lead to an increase in the quantity supplied.

As so many issues in economics, this is intuitively obvious. An increase in the market price (for whatever reason) increases the propensity of suppliers to put the good on the market. There are a few simple reasons for this – all of which deal (once again) with the willingness and ability of suppliers to put goods on the market. Just as was done in the section on the demand curve, it is necessary to clarify that supply is not the amount that suppliers would like to supply, but rather the quantity they intend to sell (= are willing and able to sell) during a given time period.
**Individual firms and the market supply curve**

Just as market demand is derived (= developed) from the individual demand curves, so too is the market supply curve. Continuing with the simple example of a market for DVDs, let us assume there are three firms on the market selling DVDs.

In Figure 5.2, each of the firms has an individual supply curve. Firm A is able and willing to put 2,000 DVDs on the market at a price of MXN50 and 6,000 at a price of MXN150. The supply curves for Firm B and C show, respectively, 2,000 DVDs and 10,000 at these two prices. Summing up horizontally, the market supply curve shows that firms on the market will supply a total of 8,000 DVDs at a price of MXN50 and 24,000 at a price of MXN150.

**Upward sloping supply curve**

In Figure 5.3, if the price of DVDs rises from MXN100 to MXN150, the *quantity supplied increases* from 16,000 DVDs to 24,000 per week. This is in accordance with the law of supply; a higher price creates an incentive (the possibility of higher profit) for producers/suppliers to put more of the good on the market.

We once again use the *ceteris paribus* assumption when drawing the supply curve. However, it is not incomes, preferences and other goods’ prices that are kept constant (as we did in drawing the demand curve) but the price, availability and quality of production factors which we assume to be constant. (There are also various forms of government intervention which affect supply. More later.)

**Figure 5.2: Individual supply and market supply for DVDs in Naucalpan**

**Figure 5.3: Market and upward sloping supply curve**

Let’s look more closely at the issue of the upward slope of the supply curve for DVDs in Naucalpan, Mexico. It is almost intuitive that higher prices would cause existing stores to increase available stocks of DVDs. There are two reasons for this positive correlation.

- The first is that a higher ticket price might add to firms’ *revenue* (price times quantity), and perhaps also additional to *profit* (total revenue minus total costs – more in later chapters). Thus, if the market price rises
suppliers will have an incentive to put more of the good on the market. In the case of DVDs, sales outlets (suppliers) will order more stocks of DVDs from regional wholesalers and put more DVDs on their shelves.

- The other reason why an additional quantity is supplied at a higher price deals with the costs of producers. (A key issue here are rising marginal costs, a HL concept in Chapter 23, Theory of the Firm.) It is easy to understand that different suppliers have different cost levels. If the market price is MXN100 and the cost to a supplier in getting hold of an additional DVD to sell is MXN101…then basically the supplier would lose MXN1 for an additional DVD and it would not be provided. Now, if the market price rises to MXN102, then the supplier would not only be willing but able to provide the additional DVD.

### WARNING!

**Law of Supply**

*Important note:* ‘Supply’ is NOT the same as ‘quantity in existence’!!! It is most important that you understand at an early stage that having 200 tonnes of cheese in a storage room is not the same as 200 tonnes being on the market. You see, if the producer of the cheese in question is simply storing the cheese then it is not actually offered on the market. It is not part of supply. It will become part of supply if the market price of this cheese increases to the level where the producer decides that it is not worth storing anymore and offers it for sale.

**Thus:** oil in an oil-field is NOT part of supply; oil in a cistern which is offered to a petroleum company IS part of supply. Schools of tuna fish are NOT part of supply; when tins of tuna held in a warehouse are offered to the supermarkets they ARE part of supply.

### Movement along vs. shift of supply curve

In Figure 5.3 above, assume that the initial price is MXN100 and thus that quantity supplied per week is 16,000 DVDs. If the price increases to MXN150, then the quantity supplied increases from 16,000 DVDs per week to 24,000. This is shown by a movement along the supply curve, from point A to C, which means, using correct economic terminology, that ‘...the quantity supplied increases...’ Accordingly, a decrease in the price from MXN100 to MXN50 is a movement along the supply curve from point A to B – the quantity supplied has decreased from 16,000 DVDs per week to 8,000.

### Shifts in the supply curve

As will be done in some depth further on, any change in the price, availability, quantity and quality of factors of production will cause a change in supply – e.g. a shift in the supply curve. Figure 5.4 below shows that any change in a non-price variable off supply causes a shift in the supply curve.

**An increase in labour costs or expectations of falling demand in the future (non-price variables of supply) leads to a decrease in supply for DVDs. This is shown by a leftward shift of the supply curve.**

**An increase in income (a non-price variable of demand) leads to an increase in demand for DVDs. This is shown by a rightward shift of the demand curve.**

**Figure 5.4: Shifting the supply curve for DVDs**

### Non-price determinants of supply

Just as in demand, there are “other variables” affecting supply within the ceteris paribus assumption. These are non-price determinants of supply. Any change in a non-price determinant of supply means that the pattern of supply changes – shown by a shift of the supply curve. Profit incentive and covering increasing (marginal) costs explain why the supply curve is upward-sloping and (just as in the pattern of demand) there are a number of non-price determinants of supply, all of which will shift the supply curve.
Definition: ‘Non-price determinants of supply’
Any variable that changes the pattern of supply other than price is a non-price determinant of supply. Changes in the price, availability, quality and quantity of factors of production will all have an effect on the supply of goods.

The non-price determinants of supply can be divided into four main categories:

1. Changes in relevant market factors: these are costs of factors of production; price of related goods (producer substitutes); firms’ expectations; and market entry/exit

2. Changes in availability/scarcity of factors of production: these include reserves of natural resources; weather and climate changes; natural disasters

3. Changes in the quality/quantity of factors of production: factor inputs improve over time due to improved production methods; technological advances, and advances in materials

4. Market intervention (non-market variables) by government such as taxes and subsidies.

1. A change in relevant market factors

Cost of factors of production: Any increase in costs to suppliers will mean that the cost of producing goods will increase. This lowers the ability and willingness of suppliers to put the goods on the market (since they cannot influence the market price) and producers will respond by decreasing output. Decreased raw material prices, lower labour costs and lower rents would all cause production costs to decrease and supply to increase. Thus, if wages or salaries rise, then the workers used in production become more costly whereupon producers will decrease output – e.g. the supply curve shifts left. Substituting ‘Swiss watches’ for ‘DVDs’ in Figure 5.4 illustrates how an increase in labour costs for Swiss watch manufacturers would cause a shift in the supply curve to the left, from $S_0$ to $S_1$, i.e. fewer watches are supplied at $P_0$ and at all prices.¹

Price of related goods: Producers will have any number of possible producer substitutes (not to be confused with consumer substitutes!) such as DVDs and Blu-Ray discs. An increase in demand/price for Blu-Ray discs might cause suppliers to reallocate (= shift) resources from the production of DVDs to Blu-Ray discs, causing the supply of (the producer substitute) DVDs to decrease from $S_0$ to $S_1$ as shown in Figure 5.4.

Another possibility is that producers have goods that are in joint supply. An example would be gold and copper which are often found in the same geological veins and pockets. An increase in the price of gold would lead to an increase in the quantity supplied of gold (a movement along the supply curve for gold) which in turn would increase the supply of copper, illustrated by the rightward shift in supply ($S_0$ to $S_1$) in Figure 5.4. In a similar vein (pun intended), a decrease in the price of beef would lead to a decrease in the quantity supplied of beef (movement along the supply curve for beef) and therefore also a decrease in the supply of leather (shift left of the supply curve for leather).

• The expectations of firms: If firms expect a surge in demand, such as seasonal demand for tourism, they might actually increase supply of, say, rental cars in order to build a sizable stock for the coming increase in demand. Figure 5.4 shows how anticipation of the tourist season in Cancun, Mexico, could lead suppliers of rental cars to increase supply from $S_0$ to $S_2$.

• Market entry/exit: If existing firms on a market are making a profit, newcomers might be attracted. As firms enter the market, total supply of goods will increase. This is often the case for new products, where the success of the iPhone resulted in a rapid increase in “copycat” (= similar, copied) products. In the same way, if an industry becomes less profitable then firms will leave the market, decreasing supply, for example the decline in the Swedish ship-building industry in the 1980s caused by far more competitive ship-builders in Korea. ($S_0$ to $S_1$ in Figure 5.4).

2. A change in the availability/scarcity of factors of production

• Availability and scarcity of factors: Any and all factors used in production are subject to relative scarcity. Should factors become more available or abundant, then the same market laws will apply to them, i.e. scarcity will raise the price of any given factor of production. Studies show that during the end of

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¹ I did not use labour costs as an example randomly! Raw material costs – even such precious metals as gold and platinum – represent a fraction of the final value of a good Swiss watch. Perhaps the most complicated watch in the world, “Calibre 89” made by Patek Philippe for its 150th anniversary in 1989, contains 1728 parts, and had four people working on it for nine years (!) measured from initial research/design to final completion. When I get the required USD6 million together from book sales I’m going to get one.
the decade, teachers in Sweden will be retiring at a rate far beyond the rate of replenishment via teacher colleges. This will decrease the supply of teachers – and hopefully raise the salaries of those of us who remain in the profession. As for tangible (= physical) goods, suppose that the existing diamond mines in Botswana, Namibia, South Africa and Russia start to peter out (= diminish). This would mean that there would be less diamonds available no matter what we are willing to pay for them. While there is a nifty Swedish firm selling jewellery made from elk excrement, I don’t envision this being a viable substitute in the context of weddings.

- **Force majeure, unexpected events:** Disruptions such as earthquakes, fires, floods and other natural disasters can have significant effects on the supply of goods – not only agricultural goods but all goods needing transport. Look at the frequent disruptions to oil supply; every time there is a terrorist attack (Iraq; blown up pipelines), flood (Mexico; workers can’t get to the off-shore wells) or hurricane (Texas; destroyed oil refineries) there is a resulting decrease in the supply of oil and petroleum products.

In the same mode, an increase in the supply of factors will both increase availability and lower the costs for producers. Just imagine how the discovery of new oil fields would help suppliers all around the world by lowering the dependency on the oil cartel, OPEC. Another thing mentionable in this context is the effect of weather conditions on agricultural output. During 2008 tens of thousands of people in Ethiopia once again faced starvation according to the FAO due to lower than normal rains and poor harvests.

### 3) A change in the quality/efficiency of factors of production

- **The quality of factors of production:** Anything which enables a producer/supplier to put more on the market without increasing costs means that supply increases, i.e. the supply curve shifts to the right. Better production methods and/or a more educated and well-trained labour force would increase output during any given time period. This is an increase in the efficiency in use of factors – enabling the subsequent increase in productivity. *Production techniques* (division of labour for example), *advancing technology* (computer assisted design and computer assisted manufacturing – CADCAM to name but one), new and *improved materials* in production (any number of ceramics), and of course anything dealing with increasing *knowledge*, research and development (R & D), education, training….etc.

- **Technology:** Better tools, production processes, materials, computer assisted design and computer assisted manufacturing – CADCAM …etc, are all elements of advancing technology which increase output per unit of time, which is the same as increasing supply. For example, it now takes General Motors in North American an average of 24.4 hours to assemble a vehicle – 6.4% shorter time than the year before.

### 4. Market intervention – taxes and subsidies

In addition to the forces arising from within the market itself, there are also forces which can be said to be imposed from without, i.e. market intervention by government. Two common ways for governments to intervene are by imposing an *indirect tax* on goods or subsidising goods. An indirect tax – an expenditure tax – such as value-added tax (VAT) on goods sold is a percentage increase of the sales price of the good and will in effect be an increase in costs for producers, thus decreasing supply. A subsidy is the opposite, a payment to producers (often

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3 Food and agricultural organization of the United Nations.  
4 *US carmakers’ efficiency rises…*, Business Week 30 June 2003  
5 Indirect taxes are taxes which indirectly go to government, since VAT is paid to the suppliers who then in turn transfer the taxes to government. A direct tax is income and profit (corporate) tax, since this goes directly to government. We get shafted either way.
Markets and Supply

Definition: ‘Indirect tax’ and ‘subsidy’

An indirect tax such as an expenditure tax is added to the price of the good and causes suppliers to increase the price at all levels of supply. The supply curve shifts left.

A subsidy is a payment or money grant to suppliers. This works as an incentive to produce more and also lowers (marginal) costs of production. The supply curve shifts right.

OUTSIDE THE BOX

‘Mermaidomics’ revisited – ‘backward bending’ S-curve?!

During the speculative oil price shock of 2007/08, several economic commentators observed that oil suppliers in fact had an incentive to decrease output of oil as the price rose. This seemingly contradicts economic theory, yet in fact it can be explained quite logically.

<table>
<thead>
<tr>
<th>$/barrel</th>
<th>barrels/month</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Q0</td>
</tr>
<tr>
<td>P2</td>
<td>Q1</td>
</tr>
</tbody>
</table>

Revenue gain

Revenue loss

Figure: 5.5 Supply of oil

The price of oil is at $P_0$ and rises to $P_1$; the quantity supplied of oil increases to $Q_1$. Now, assume that:

1. Oil production starts to reach maximum (short run) output potential, and

2. Oil producers have a level of target revenue, i.e. an aimed-for level of oil revenue.

Two forces kick in which in fact might cause oil suppliers to decrease the quantity supplied; expectations of higher future oil prices and limited investment alternatives.

Expectations: Assume that suppliers are satisfied with the oil revenues at $P_1$. This is the area given by $P_1 \times Q_1$. A rise in price to $P_2$ means that suppliers can in fact decrease quantity supplied on the oil market ($Q_2$) while retaining the target revenue. (The loss of revenue – grey area – is equal to the gain in revenue shown by the green area.) If suppliers expect oil prices to remain high or continue upwards, they have an incentive to hold off on increasing capacity and supplies – they can sell less and still make at least the same revenue in the future.

Investment alternatives: Oil is a finite resource. Any oil left in the ground is a form of investment. Basically, by leaving the oil in the ground and – in line with the expectations-based argument above – betting on permanently higher oil prices, producers have “invested” in future oil revenues. As suppliers are reaching maximum short run output levels at $P_1$, increasing costs of extraction above $P_1$ simply might lead suppliers to hold off on production increases.


Summary of supply shifts

By now you should be accustomed to the methodology I use in explaining concepts. I try to follow a ‘define – exemplify – context’ formula, which I realise is both time consuming and frequently tiresome. Therefore, I shall simplify the iteration of changes in supply by using the nine additional examples used previously in a table below and labelling them accordingly in Figure 5.6.
1. A change in the relevant market factors

<table>
<thead>
<tr>
<th>Example:</th>
<th>Effect:</th>
<th>Supply will:</th>
<th>In fig: 5.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) wages for road workers fall</td>
<td>cost of making roads falls</td>
<td>supply curve for roads shifts right</td>
<td>$S_0$ to $S_2$</td>
</tr>
<tr>
<td>b) price of steel rises</td>
<td>cost of making cars rises</td>
<td>supply curve for cars shifts left</td>
<td>$S_0$ to $S_1$</td>
</tr>
<tr>
<td>c) price of flour falls</td>
<td>cost of making bread falls</td>
<td>supply curve for bread shifts right</td>
<td>$S_0$ to $S_2$</td>
</tr>
</tbody>
</table>

2. A change in the availability/scarcity of factors of production

<table>
<thead>
<tr>
<th>Example:</th>
<th>Effect:</th>
<th>Supply will:</th>
<th>In fig: 5.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>d) fewer study medicine</td>
<td>fewer doctors in hospitals</td>
<td>supply curve for health care shifts</td>
<td>$S_0$ to $S_1$</td>
</tr>
<tr>
<td>e) pilots go on strike</td>
<td>fewer flights available</td>
<td>supply curve for air travel shifts</td>
<td>$S_0$ to $S_1$</td>
</tr>
<tr>
<td>f) new copper deposits found</td>
<td>more copper available</td>
<td>supply curve for electrical wire</td>
<td>$S_0$ to $S_2$</td>
</tr>
</tbody>
</table>

3. A change in the quality/efficiency of factors of production

<table>
<thead>
<tr>
<th>Example:</th>
<th>Effect:</th>
<th>Supply will:</th>
<th>In fig: 5.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>g) increased use of robots</td>
<td>industrial production is faster</td>
<td>industrial supply curve shifts right</td>
<td>$S_0$ to $S_2$</td>
</tr>
<tr>
<td>h) better basic education</td>
<td>all labourers more efficient</td>
<td>supply curve for most goods shifts</td>
<td>$S_0$ to $S_2$</td>
</tr>
<tr>
<td>i) IT revolution</td>
<td>most production more efficient</td>
<td>supply curve for most goods shifts</td>
<td>$S_0$ to $S_2$</td>
</tr>
</tbody>
</table>

4. Non-market variables, i.e. intervention

<table>
<thead>
<tr>
<th>Example:</th>
<th>Effect:</th>
<th>Supply will:</th>
<th>In fig: 5.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>j) increased restrictions on</td>
<td>fewer sales outlets for cigarettes</td>
<td>supply curve shifts to the left</td>
<td>$S_0$ to $S_1$</td>
</tr>
<tr>
<td>cigarette sales</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k) taxes on gasoline are increased</td>
<td>firms must pay a portion of sales revenue to government</td>
<td>supply curve shifts to the left</td>
<td>$S_0$ to $S_1$</td>
</tr>
<tr>
<td>l) a subsidy is granted for the production of milk</td>
<td>milk producers have an incentive to produce more milk and production costs decrease</td>
<td>supply curve shifts to the right</td>
<td>$S_0$ to $S_2$</td>
</tr>
</tbody>
</table>

Figure 5.6
What we now need to do is put the supply and demand curves together in the same diagram, in order to be able to analyse market behaviour. It bears repeating: nothing done so far has equipped you with the necessary tools to do a market analysis! For this you need supply and demand working together, not the separate (purely explanatory!) graphs done thus far. Let’s put it all together people.

Putting the pieces together

Wage negotiations

A few years ago I had a horrendous row with my (then) boss. What the issue boiled down to was my unwillingness to accept more teaching hours and more students without a substantial rise in my salary. Being me, I used a great deal of harsh language – most of it in print – and started to pack my bags and empty my computer. I was simply not prepared to give up any more of my increasingly valuable (i.e. scarce!) free time without increased remuneration (=payment). One could say that my opportunity costs of teaching additional classes were increasing and that I wanted my income to match this increased cost. This would render Figure 5.6 below. (We are assuming that my supply curve would be ‘normal’, i.e. I would supply more labour at a higher salary.)

You get the drift. This would mean more hours taught at all price levels. This is shown in Figure 5.8. If, for example, I accepted a better office rather than an increase in pay, I would provide additional teaching service at the same price – increasing my supply from $S_0$ to $S_1$. As the price hasn't changed, and the amount of teaching hours supplied has increased, supply has increased I have increased my willingness to supply teaching hours at all prices.

A I have in fact more ex-bosses than ex-wives.

B A wage means "x dollars per hour", i.e. an amount of money per labour hour. A salary is not based on an hourly rate but is a fixed sum per month. Auto-workers get wages, teachers get screwed salaries.

C No wait – I didn’t attend those anyhow. Oh well.
HL Extensions

Linear supply function; \( Q_s = c + dP \)

We now do the other hand – the upward sloping S-curve. Same type of formula but we use other letters so as not to confuse things with the D-function. Also, we will need to calculate equilibrium later on so we will need four different letters for the parameters – two for the demand function and two for the supply function.

\( Q_s = c + dP \)

\( Q_s \): quantity supplied (at a given price)

\( c \); autonomous level of supply (e.g. unrelated to price changes)

\( d \): is the responsiveness of quantity supplied to a change in price – this is the slope

\( P \): price

We basically see that \( Q_s \) is a function (‘a result of a change in’) the price of the good; \( \Delta P \rightarrow \Delta Q_s \). Assume that our (linear) supply function is \( Q_s = -2,000 + 40P \) – at \( P=0 \) \( Q_s \) will be -2,000 units – which is silly in realistic terms but simply shows that the supply curve will have a positive value on the \( P \)-axis, e.g. suppliers have a ‘minimum price’ before they supply any units at all on the market.

The \( P \)-intercept is given by \( c \); \( \frac{2,000}{40} = 50 \).

Thus suppliers demand a minimum of $50 to put any units on the market (At \( P=50 \) \( Q_s \) is zero units.) The constant ‘\( d \)’ is 40 – this tells us that for every increase in price of $1, suppliers will be able and willing to put an additional 40 units on the market. Figure 5.9 illustrates the initial supply curve.

The equation \( Q_s = -2,000 + 40P \) transforms to \( P = \frac{Q_s + 2,000}{40} \) or \( P = \frac{Q_s}{40} + 50 \). It is in this form that the graph can most easily be plotted with \( P \) on the vertical axis and \( Q_s \) on the horizontal axis.

![Figure 5.9 Supply curve for the function \( P = \frac{Q_s}{40} + 50 \) (or \( Q_s = -2,000 + 40P \))](image-url)
Shifting the supply curve, e.g. a change in c

Any change in c will result in a shift of the demand curve, shown in Figure 5.10:

- **Decrease**: if supply decreases by 1,000 units at each price level, then there is a leftward (parallel) shift of the supply curve and the Q-intercept is -3,000. If supply decreases by 50% at all prices
  - The P-intercept is $\frac{3,000}{40} \frac{C}{d} = \$75$

- **Increase**: if supply increases by 1,000 units at each price level, then there is a rightward (parallel) shift of the supply curve and the Q-intercept is -1,000.
  - The P-intercept is $\frac{1,000}{40} \frac{C}{d} = \$25$

A change in the slope of the supply curve, e.g. a change in d

A change in d will of course result in a change in the slope, Figure 5.11:

- Assume that the new supply function is $Q_s = -2,000 + 20P$ or $P = \frac{1}{20}Q_s + 40$
  - Basically, this tells us that for any change in P of $\$1$, the $Q_s$ will increase by 50 units
  - An increase in price of 25 $\rightarrow \Delta Q_s$ of 1,250
  - An increase in price of 50 $\rightarrow \Delta Q_s$ of 2,500
  - The Q-intercept is still -2,000 but the P-intercept is $\frac{2,000}{50} \frac{C}{d} = \$40$
- A supply function of $Q_s = -2,000 + 20P$ or $P = \frac{1}{20}Q_s + 100$ increases the slope (from $\frac{1}{20}$ to $\frac{1}{26}$)
A change in price of $1 causes an increase in Qs of 20 units.

The Q-intercept is still -2,000 but the P-intercept is \( \frac{2,000}{-20} = \frac{c}{d} = $100 \)

The shift (\( \Delta c \)) and changes in slope (\( \Delta d \)) are of course caused by changes in all the usual non-price determinants of supply such as a change in the price/availability of raw materials and labour, market entry by firms, increases in productivity and market intervention such as taxes and subsidies.

The shift (\( \Delta c \)) and changes in slope (\( \Delta d \)) are of course caused by changes in all the usual non-price determinants of supply such as a change in the price/availability of raw materials and labour, market entry by firms, increases in productivity and market intervention such as taxes and subsidies.

\[ \text{Figure 5.11 Changing the slope of the supply curve} \]

**POP QUIZ 5.1**

1. Assume a supply function of \( Qs = 200 + 10P \). This tells us that:
   i. This is an inelastic supply curve – e.g. the supply curve intercept on the Q-axis will be a positive value (at a price of zero quantity supplied is 200)
   ii. The P-intercept will be negative (solving for Q = 0 gives us a price of -20)
   iii. The slope is 10; for each $1 increase in price, Qs increases by 10 units

2. Make a simple table showing the Qs when P=0, $10, $20, $30 and $40
3. Illustrate these values (pairs) in a diagram, e.g. draw a supply curve.

4. Draw a new supply curve based on the price of raw material decreasing – this leads to a 20% change in supply for our good but no change in slope.

5. Draw another supply curve in the same diagram showing that the slope changes. For each $1 increase in price, the Qs increases by 8. (Q-intercept remains unchanged.)

Summary & revision

1. **Law of supply**: an increase in the price of a good – *ceteris paribus* – will lead to an increase in the quantity supplied

2. **Individual supply**: the willingness/ability of an individual firm to put goods on the market at different prices during a period of time

3. **Market supply**: sum of all individual supply curves

4. Upward sloping supply curve has two causes:
   
   a. Incentives – if the market price rises for a good suppliers will have an incentive to put more of the good on the market.

   b. Increasing costs – as costs increase for producers in putting additional units on the market, only higher market prices will induce them to increase the quantity supplied in that increasing (HL: marginal) costs may be covered.

5. A change in price leads to a movement along the supply curve.

6. A change in a non-price variable affecting supply leads to a shift in the demand curve, e.g.:
   
   a. Change in price/availability/quantity or quality of factors of production.

   b. Change in the price of producer substitutes.

   c. Expectations of firms.

   d. Market entry/exit by other firms.

   e. Government intervention (taxes and subsidies).

**HL extensions**

7. Linear supply function: \(Q_s = c + dP\).

8. Shifting the supply curve (\(\Delta c\)).

9. Changing the slope of the supply curve (\(\Delta d\)).