*Controversies in Economics and Finance*
*Puzzles and Myths*
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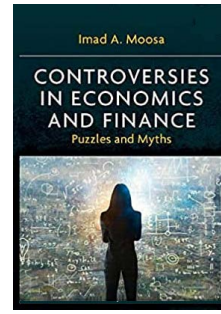


# 1. Puzzles and myths: a general overview

## 1.1 THE CONCEPT OF PUZZLE

This book is about puzzles and myths in economics and finance. It seems appropriate, therefore, to start by defining and describing the concepts of 'puzzle' and 'myth' before embarking on a discussion of specific puzzles and myths that arise in various research areas such as international finance and macroeconomics. This section is about puzzles as understood in general terms, whereas the concept of myth will be dealt with later on in this chapter.

A puzzle is an enigma, an observation that baffles or confuses observers. It could be a question that is yet to be answered or an unresolved problem that is intricate enough to be perplexing to the mind. The word 'puzzle' is a synonym of 'paradox', albeit with a subtle difference: a puzzle is anything that is difficult to understand or make sense of, whereas a paradox is a self-contradictory statement that can be true only if it is false, and vice versa. We will find out, however, that paradoxes in economics are puzzles, or allegedly so, which (for some reason) are called paradoxes rather than puzzles. For example, the Gibson paradox (that interest rate and the general price level are positively correlated) can readily be called a puzzle because the underlying empirical observation is not consistent with some theory. It will be argued later that the Gibson paradox is neither a paradox nor a puzzle.

According to Danesi (2018), 'the English word *puzzle* covers a broad range of meanings, referring to everything from riddles and crosswords to Sudoku and conundrums in advanced mathematics'. The word appeared for the first time in *The Voyage of Robert Dudley Afterwards Styled Earl of Warwick & Leicester and Duke of Northumberland*, a book that was published around 1595, in which the word 'puzzle' was used to describe a game. According to Danesi, it is most likely that the word 'puzzle' is derived from the Middle English word *poselen* (to bewilder or confuse), which is associated with endeavours to solve puzzles.

Danesi (2018) also refers to a definition put forward by a brilliant puzzle-maker, Scott Kim, who defines a puzzle as 'something that is fun

and has a right answer' (Kim, 2006). Scott Kim's definition, therefore, encompasses two characterizations: (1) a puzzle is a source of fun; and (2) it has a right answer. These two characterizations imply that puzzles represent a form of play that is distinguishable from other forms of play, such as games and toys. The *Random House Dictionary* defines a puzzle as a 'toy or other contrivance designed to amuse by presenting difficulties to be solved by ingenuity or patient effort'. This definition implies that the two main skills required for solving puzzles are ingenuity and patience.

## 1.2 THE PUZZLES OF SCIENCE

In science, puzzles are typically unsolved mysteries that have defied scientific and technological progress. For example, we still do not know why we need to sleep, why we do not feel the earth spinning, and where Earth's water came from. We do not know what the universe is made of, how life began, whether or not we are alone in the universe, why we dream, and whether or not time travel is feasible. These are puzzles because of the unavailability of a universally acceptable answer for any of them.

In mathematics, a large number of puzzles or problems have not been solved yet. Distinction is typically made between mathematical problems and mathematical puzzles, based on the recreational characteristic of puzzles (the latter are supposed to be recreational). However, this distinction is only valid for non-mathematicians. In this sense a mathematical puzzle is what follows in the sequence 2, 5, 11, 23, 47, . . . (the answer is 95) whereas a mathematical problem is working out the integral of $x^x$. For mathematicians, however, mathematical problems that baffle or confuse are, by definition, puzzles. If a puzzle must have a right answer, according to Kim (2006), then finding what follows in the sequence 27, 46, 29, 49, 34, . . . is not a puzzle, although it looks very much like a puzzle. This is because the sequence is a collection of random numbers between 1 and 50 (generated from a uniform distribution), in which case the following number could be anything between 1 and 50; hence no right answer. Alternatively, it makes sense to suggest that this is a puzzle but that Kim's definition is wrong.

In 2000 the Clay Mathematics Institute suggested seven Millennium Prize Problems and offered a $1 million prize for solving each puzzle. Out of the seven puzzles, only one has since been solved, the Poincaré conjecture, not that it was an easy task. The conjecture can be traced back to the beginning of the 20th century when Henri Poincaré, a French mathematician, was working on the foundations of topology (a branch of mathematics that deals with the geometrical properties and spatial relations unaffected by the continuous change of shape or size of figures).

Over time, the conjecture proved to be extremely difficult to solve, but after nearly a century of failed attempts, a brilliant Russian mathematician, Grigori Perelman, presented a proof of the conjecture in three papers made available in 2002 and 2003 on arXiv. As a result, he was awarded the Millennium Prize of $1 million, which he declined.

Does the Poincaré conjecture sound like a puzzle in general terms? It was an unanswered question and unsolved problem that baffled and confused mathematicians for more than 100 years. Further properties of the Poincaré conjecture that are shared with generic puzzles are that it has a right answer and that its solution requires (enormous) ingenuity and patience. Puzzles are written, and this particular puzzle was written by Henri Poincaré. However, it would be a stretch of imagination to suggest that it is a source of fun and amusement, even less so as a form of play, except perhaps for a genius such as Grigori Perelman.

## 1.3 THE PUZZLES OF ECONOMICS AND FINANCE

The puzzles of economics and finance predominantly take the form of empirical or conceptual anomalies that allegedly remain unresolved and present a challenge to economists. Empirical anomalies, hence puzzles, arise when the implication of a theory is inconsistent with observed economic data; that is, when empirical testing does not support the theory. Alternatively, a puzzle arises when an observed phenomenon cannot be explained. In the second case, however, once a puzzle has been established, various plausible explanations are rejected by the originators, no matter how plausible they are. This is why, once perceived, the puzzles of economics and finance tend to persist and thrive.

The problem with the description of a puzzle in economics – that theory is inconsistent with data – is that it is based on the assumptions that the observed economic data are measured correctly, that the techniques of econometric testing are valid and produce consistent results, that economists conduct research because they are on a quest for the truth without any biases, and that economics is as rigorous as physics because economic phenomena are governed by laws, the laws of economics. A puzzle arises because of firm belief in theory, so that when empirical testing rejects it, a puzzle arises. This makes one wonder: why bother about testing the theory in the first place?

Testing economic theories is based predominantly on faulty data. In the natural sciences, investigators make their own measurements through experiments (as in testing Boyle's law) and other scientific procedures; for example, by measuring the distance from Earth to a certain galaxy

or the height of a mountain. In economics, however, the economy itself generates data in vast quantities. In essence, economists use accounting data representing recorded transactions and activities. The problem with accounting data is that they are not collected for the purposes of a specific project that an economist is working on. This causes all sorts of problems, as the economist does not have any control over non-experimental data. Econometrics is used to deal with or solve problems such as measurement errors, but whether or not the treatment is adequate is a different matter. It certainly is not.

Baltagi (2002) argues that the data collected for applied econometric research are not ideal for the economic question at hand because they were posed to answer legal requirements or to comply with the rules set by regulatory agencies. Griliches (1986) describes the situation as follows:

> Econometricians have an ambivalent attitude towards economic data. At one level, the 'data' are the world that we want to explain, the basic facts that economists purport to elucidate. At the other level, they are the source of all our trouble. Their imperfections make our job difficult and often impossible . . . We tend to forget that these imperfections are what gives us our legitimacy in the first place . . . Given that it is the 'badness' of the data that provides us with our living, perhaps it is not all that surprising that we have shown little interest in improving it, in getting involved in the grubby task of designing and collecting original data sets of our own. Most of our work is on 'found' data, data that have been collected by somebody else, often for quite different purposes.

To do what scientists do, Griliches (1986) goes on to say the following:

> The encounters between econometricians and data are frustrating and ultimately unsatisfactory both because econometricians want too much from the data and hence tend to be disappointed by the answers, and because the data are incomplete and imperfect. In part it is our fault, the appetite grows with eating. As we get larger samples, we keep adding variables and expanding our models, until on the margin, we come back to the same insignificance levels.

The conventional wisdom that the techniques of econometric testing are valid and produce consistent results is questionable because econometrics is a con art that can be used to prove anything. Any negative evidence can be turned to be supportive by using different techniques, different data sets, different functional forms, and so on. Empirical evidence on an issue is always a mixed bag and never consistent. This is why every economic theory has supportive, unsupportive and neutral empirical evidence, depending on what the researcher feels like. And what the researcher feels like depends on ideology, the urge to prove a prior belief, or the desire to

please a journal editor or a potential referee. This issue will be revisited in Chapter 5 where we examine the myths of econometrics, and referred to repeatedly when we consider individual puzzles in Chapters 2–4.

## 1.4 THE CONCEPT OF MYTH

Myths, which have been an integral part of humankind's entire history, are traditional or legendary stories, usually of unknown origin, and typically involving a hero or an event. They are symbolic tales of the distant past, ancient stories that are believed to be true. They can be found in every culture, where collective myths make up the culture's mythology. The word 'myth' can be traced back to the word *mythos*, which means a story, while the term 'mythology' denotes both the study of myth and the body of myths belonging to a particular religious tradition. The terms 'myth' and 'mythology', as we understand them today, arose in the English language in the 18th century. Myths are neither wholly true nor wholly untrue, and although some modern usages of the word have connotations suggesting that myths are irrelevant or wrong, this is not necessarily true.

Myths are characterized by certain features. McDowell (1998) describes myths as 'counter-factual in featuring actors and actions that confound the conventions of routine experience'. He argues that myths often involve extraordinary characters or episodes that seem impossible in our world, but 'the extraordinary feats and traits of mythic protagonists are possible only because they attach to a primary and formative period in the growth and development of civilization'. Myths may appear to be in opposition to science because they are not testable. Magoulick (2015) identifies 12 characteristics of myths, including the following: (1) a story that is or was considered a true explanation of the natural world; (2) characters are often non-human, such as gods, goddesses and supernatural beings; (3) the setting is a previous proto-world (somewhat like this one but also different); (4) they depict events that bend or break natural laws; and (5) they evoke the presence of mystery, the unknown. For some scholars, myths are inaccurate accounts of real historical events.

The themes of several noteworthy myths have been retold in various ways across many cultures, predominantly the 'creation myth' and the 'flood myth', which are popularly retold within the context of religion. The creation myth involves humans, the universe, or some other element of life. The flood myth depicts a great flood sent by God to destroy humankind, often as a form of punishment for forgetting the power and importance of divine rule. For example, the biblical story of Noah's ark is a representation of the flood myth in Christianity (and Islam). Furthermore, most

religions have a form of creation myth that explains the existence of the universe and humankind.

## 1.5 THE MYTHS OF ECONOMICS AND SCIENCE

Peet (1992) attributes the rise of myths in economics to the 'lack of validity of much of standard economic theory', which 'comes mainly from within the economics profession itself'. Effectively, this means that myths are associated with neoclassical economics. He goes on to say the following:

> Much of theoretical economics has ceased to be related to real human societies. This is part of the reason why mainstream market liberal economics on the one hand and anthropology, sociology, and psychology on the other have drifted so far apart. The latter are based largely on empirical observation; the former, largely on a nineteenth-century logical-mathematical approach.

He quotes Peter Wiles as saying that 'the main thing that is wrong with economics is its disrespect for fact', and that 'it is perfectly possible for a science to be sick, and ours [economics] is now'. Myths in economics may not be myths for all. What is a myth for one school of thought is an undisputed fact of life for another. This is so much the case because, as Peet puts it, 'the scope of positive economics is smaller, and that of normative economics larger, than is frequently claimed by economists'. Normative economics involves value judgement on what ought to be, but what ought to be for Economist A is not so for Economist B. For A, private ownership of production facilities is conducive to efficiency and wealth creation, which is a myth for B.

For Peet (1992), myths arise in mainstream neoclassical economics, which follows the methodology of physical science. For example, he attributes the 'myth of rational behaviour' to the observed behaviour of particles in classical physics, which is assumed to be present in human behaviour. While rational behaviour is at the core of neoclassical economics, it is rejected by those studying behavioural economics, which has elements of psychology. Therefore, rationality is a myth as far as behavioural economists are concerned, but it is an undisputed fact of life for those believing in the principles of neoclassical economics.

Peet goes on to examine a number of myths arising from neoclassical economics, including the myth of bounded rationality, whereby people make decisions without perfect knowledge. In some respects, however, this approach is an alternative view to that of neoclassical economics, reflecting the fact that human behaviour consistently violates the principle of rationality. Unlike straight rationality, the proponents of the bounded rationality

approach agree with the proposition that people have limited cognitive capabilities, implying limitations in attention, perception, memory, and abilities to process information and communicate.

Other myths arising from the nature of neoclassical economics include the myth of utility, as Peet argues that 'the presumed existence of utility is rooted in political-economic beliefs and ideologies rather than empirical science'. Discounting is a myth when it is applied to human life because (at the appropriate discount rate) it leads to the conclusion that one life today is worth 150 lives ten years from now. Then there is the myth of the invisible hand, that each individual who acts in their self-interest promotes the interests of the society, and the myth of stability, that the world is an unchanging, static system, or else it changes slowly. These may be myths for Peet but not so for neoclassical economists.

Science has its own share of myths, even though myths and science may be viewed as being diametrically opposed to each other. In the 1960s, Popper (1963) put forward the view that 'science must begin with myths, and with the criticism of myths'. It seems that myths are present in science because, as Peet puts it, 'there is a long history of gullibility, ignorance, and stupidity among scientists'. Scientific objectivity is a myth as scientists may take on responsibility for pronouncements in areas beyond their expertise, which is a consequence of having an inflated opinion of their ability to determine the truth of a situation from what is often nothing more than a cursory study.

## 1.6 ECONOMIC PARADOXES

Skousen and Taylor (1997) refer to three types of paradox in economics: (1) everyday observations that appear to defy common sense; (2) paradoxes that have perplexed economists in the past but have since been resolved to a certain extent; and (3) empirical or conceptual anomalies that remain unresolved and present a challenge to today's economists. Most of these paradoxes, however, sound like puzzles, in the sense that they are yet-to-be-answered questions. For example, the diamond–water paradox can be stated as an unanswered question (why is diamond more expensive than water, when the latter is by far more useful?) or it can be viewed as a self-contradictory statement that water is by far more useful, yet cheaper than diamond.

An example of the first type of paradox is the observation that some supermarket items sell for more per ounce in larger sizes. This observation is not difficult to explain, in which case it is hardly a puzzle or a paradox: it is one reason for the need to protect consumers from corporate greed.

In the absence of legislation requiring them to display unit prices on the products, supermarkets can generate more profit from large items (such as a 20 kg sack of rice) than small items by: (1) selling a big product for more than the number of units multiplied by the unit price; and/or (2) reducing the product size (the number of units) at the same price. In both cases, these are easier to hide in a big product than a small one. In fact, reducing the product size at the same price has been a common practice. Greenwood (2018) expresses this situation eloquently by saying that 'all around you, all the time, many consumer products are growing lighter, thinner, less substantial – all while maintaining the same price'. She also has the following to say:

> It's probably happened to you in a supermarket aisle, or maybe at home while making a favourite family recipe. You'll notice something odd – a can of tomato soup seems to hold less than it did, or the tuna used to be enough for three sandwiches, not two. It might dawn on you in the bathroom, where last month the household went through twelve rolls of toilet paper, up from the usual 9 or 10.

This is not a new phenomenon, but rather an old practice. In the early 1960s, the Committee on the Judiciary (1961) published a report in which the following question was raised: 'How badly have consumers been fooled?' The report makes it quite clear that 'if per-ounce cost as well as the unit cost were stamped on the package, the consumer would have no difficulty in making comparisons'. This observation is easy to explain in terms of corporate greed; it is not a puzzle, a mystery or a paradox.

An example of the second type of paradox is the diamond–water paradox of why diamond is more expensive than water. There seems to be a contradiction that although water is more useful than diamond in terms of survival, the latter commands a higher market price. It is strange that economics students are still told that this is a paradox, when the first thing these students learn is scarcity: that excess demand for a commodity brings about a high price. More than 200 years ago, Adam Smith presented a simple but plausible explanation for this paradox. In his celebrated work, *The Wealth of Nations*, he wrote the following (Smith, 1776):

> What are the rules which men naturally observe in exchanging them [goods] for money or for one another, I shall now proceed to examine. These rules determine what may be called the relative or exchangeable value of goods. The word VALUE, it is to be observed, has two different meanings, and sometimes expresses the utility of some particular object, and sometimes the power of purchasing other goods which the possession of that object conveys. The one may be called 'value in use;' the other, 'value in exchange.' The things which have the greatest value in use have frequently little or no value in exchange; on the contrary, those which have the greatest value in exchange have frequently

> little or no value in use. Nothing is more useful than water: but it will purchase scarcely anything; scarcely anything can be had in exchange for it. A diamond, on the contrary, has scarcely any use-value; but a very great quantity of other goods may frequently be had in exchange for it.

Smith's explanation is based on the labour theory of value. An alternative explanation is based on the theory of marginal utility: diamond is more expensive than water because it is consumed to a level at which the marginal utility is still high, whereas water is consumed to a level at which the marginal utility is low. There is indeed no contradiction between the two explanations. It takes hard work to produce a given quantity of a scarce product, which means that it will be consumed to a level at which the marginal utility is still high. The same reasoning is valid for numerous commodities that are in short supply, including truffles, saffron and caviar. In general, a commodity commands a high price if it is scarce while the demand for it is rather strong, the magical term being 'excess demand'. As I was writing these lines I decided to conduct an experiment by asking my wife, who has never studied economics, to come up with a reason why diamond is more expensive than water. Without hesitation, she said 'scarcity'. There is no paradox here, but I can see a puzzle, which is why economists still talk about the water–diamond paradox when it is intuitively easy to explain.

Most (if not all) of the paradoxes in economics can be explained easily. Most, if not all, of the paradoxes arise because of the elevation of economics to the status of physical science. In the latter, studying the effect of $x$ on $y$ is conducted in a laboratory where any other variable that affects $y$ is controlled. Economists try to do the same by running a regression of $y$ on $x$ and including the control variables $z_1, z_2, \ldots, z_n$ in the regression. The problem is that in economics we cannot control for anything, in which case we employ the *ceteris paribus* assumption, even implicitly. Economists come up with a theory stating that $x$ should affect $y$ in a certain direction, but when that is not observed it becomes a paradox. The problem here is that in theory we can assume that nothing else changes, but in reality everything changes, and some of these changes are not quantifiable or even observable. The elevation of economics to the status of physical science gives rise to paradoxes through another channel. An economist comes up with a theory that is rather elegant mathematically, but when this theory is tested the results are not supportive. This becomes a paradox, arising from belief in the power of econometric testing in revealing the truth.

Paradoxes arise in various fields of economics, including public economics, methodology, macroeconomics, microeconomics, environmental economics and international economics. In public economics we have the

Downs–Thomson paradox that improvements in the road network will not reduce traffic congestion. This is not a paradox, even by the principles of economics, the very basic theory of supply and demand. Improvements in the road network involve the provision of new roads and the upgrading of existing ones. Congestion will be reduced only if improvements do not bring about an increase in the number of road users. Traffic grows for natural reasons, such as population growth and rising standard of living, but this is not all. Bad roads entice people to use public transport, but good roads make it more convenient to use private vehicles. In general, more and better roads attract more traffic. Traffic density does not depend on one factor only, the quality of roads: we may find traffic jams where roads are really bad and where roads are good, and vice versa. Traffic density depends on other factors such as the quality of public transport and, most importantly, taxes. Traffic jams may be caused by households having more than one car. Doubling vehicle registration fees is more effective in reducing traffic jams than building new roads. This paradox is not a paradox: road improvements invite more traffic, in which case traffic jams are likely to worsen.

Another paradox in public economics is the Tullock paradox that rent-seekers wanting political favours can bribe politicians at a much lower cost than the value of the favour rendered to the rent-seeker. A simple explanation for this paradox is that rent-seekers are greedy and politicians who render services to rent-seekers are cheap and corrupt. Corrupt politicians may be content with small bribes because they do not want to make it obvious that they are receiving bribes by exhibiting lavish lifestyles. Moreover, corrupt politicians compete to offer favours to rent-seekers, thus bidding down the cost of rent-seeking. Guided by marginal analysis, rent-seekers offer bribes only if they think that they will get more in return.

In methodology we have the Easterlin paradox, which arises from the observation that happiness is an increasing function of income on a cross-sectional basis, but it is not so on a time series basis. This is a paradox only if happiness as a function of income is a universal law that holds anytime, anywhere. It is not a law, and happiness depends on more than income with cross-country variations; after all, money cannot buy love. From an econometric perspective, there is no reason whatsoever to expect cross-sectional evidence to be consistent with time series evidence. Typically, economists do not produce both time series and cross-sectional evidence on the same issue, but rather they mix data and run a panel regression, where the results turn out to be all over the place. Panel regression is no more than a ploy invented initially to boost sample sizes; it is a con job. The Easterlin paradox is not a paradox.

In macroeconomics we have the Gibson paradox: the observation that

interest rate and the general price level are positively correlated when they should be negatively correlated. Interest rate cannot be positively or negatively correlated with the general price level for the simple reason that the two variables behave differently. The general price level moves predominantly in trends, while interest rates move predominantly in cycles. The general price level hardly declines, whereas the interest rate exhibits swings in either direction. The movement of the general price level over time is smooth, whereas the interest rate is volatile. If anything, the interest rate is more likely to be positively correlated with the inflation rate, as envisaged by Irving Fisher, than with the general price level. But even positive correlation between interest rate and inflation may or may not be observed.

The expectation that the general price level and interest rate are negatively correlated is based on a combination of the quantity theory of money and the loanable funds theory. More money leads to a higher price level and also to more loanable funds, which should bring down the interest rate. Hence prices and interest rates should be negatively correlated. However, interest rates do not only depend on the money supply, or the supply of loanable funds, because other factors come into play as the interest rate assumes different roles: the cost of borrowing, the return on investment and a monetary policy tool. Furthermore, a monetary expansion may lead to a higher or lower interest rate as it exerts a negative liquidity effect, a positive price level effect and a positive inflationary expectations effect. The resultant of these effects may be positive, negative or zero, depending on their relative sizes.

Even correlation between the interest rate and inflation may be positive or negative. It is positive according to the Fisher hypothesis where the interest rate represents the rate of return on investment. In this case, when inflation or expected inflation rises, investors demand a higher level of interest rate to preserve their real return. The Fisher hypothesis is definitely valid in times of hyperinflation, and this is why interest rates in countries experiencing hyperinflation may be in three, four or even five digits. On the other hand, if the interest rate is looked upon as a monetary policy tool, a higher expected inflation rate leads to a policy decision to raise the interest rate, which presumably brings inflation down. This means that interest rate and inflation are negatively correlated, albeit with a time lag.

Another paradox in macroeconomics is the Norwegian paradox that Norway's economic performance is strong despite low research and development (R&D) investment. This is not a paradox, at least if growth is what is meant by 'performance'. The underlying assumption is that growth depends on one factor only, which is R&D investment, but this is not the case. Studies of economic growth identify some 60 or so factors that explain cross-country differences in growth. For example, Norway's

economic growth has been propelled by North Sea oil and perhaps by pro-people socioeconomic policies that enhance human capital.

In microeconomics we have the Giffen paradox, which is a paradox because it violates the 'law' of demand, when in fact there are no laws in economics and because, as usual, the effects of other factors on demand are ignored. Basic microeconomics tells us that demand depends negatively on the price of the commodity, positively on income, positively or negatively on the prices of other goods, positively or negatively on taste, positively or negatively on regulation, positively or negatively on technology, and so on. A rise in the price, therefore, will not necessarily reduce demand. Also at play is the elasticity of demand: when demand is inelastic a price rise brings about no change in demand, perhaps even an increase, as consumers reallocate expenditure from one good or a class of goods to others.

In microeconomics we also have the Jevons paradox and the Khazzoom–Brookes postulate. The Jevons paradox is the observation that consumers tend to travel more when their cars are more fuel-efficient. The Khazzoom–Brookes postulate is that improvement in energy efficiency boosts energy consumption. Improvement in fuel efficiency brings down the cost (price) of travel, leading to an increase in demand. The same applies to increasing energy consumption. It seems that if consumers demand less travel and less energy as the price declines, that would be more like a paradox.

Yet another paradox in microeconomics is the Icarus paradox, the observation of businesses failing abruptly after a period of apparent success, where this failure is brought about by the very elements that led to their initial success. According to Miller (1992), success seduces companies into failure by fostering overconfidence, complacency, specialization, exaggeration, dogma and ritual. Overconfidence is a well-known behavioural bias, which may take one of three forms: (1) overestimation of one's actual performance; (2) overplacement of one's performance relative to others; or (3) excessive confidence in own beliefs. The third form is quite common, and it can be hazardous by leading to unpleasant outcomes, particularly if the beliefs are unfounded, defy common sense, or when they cannot be substantiated. Overconfidence on its own can explain why a business may fail if success induces overconfidence. This is not a paradox.

In environmental economics we have the green paradox, which is not a paradox. It is the observation that an environmental policy aimed at slowing down global warming ends up accelerating it. This is not a paradox, because the producers of fossil fuel determine the aggregate rate of extraction that maximizes their net worth in the long run. If environmental policy becomes progressively greener, this will motivate those producers to extract resources at a higher rate, thus aggravating global warming. The profit maximization postulate is at play here.

Last, but not least, paradoxes arise in international economics. The first is the impossible trinity of fixed exchange rates, independent monetary policy and free capital movement. This is not a paradox, but rather a typical situation of choice and trade-off; these situations often arise in economics and finance. As a matter of fact, even two of the three may not be compatible. A fixed exchange rate is not compatible with free capital movement unless the central bank has adequate financial resources to defend the fixed rate by intervening in the foreign exchange market. A fixed exchange rate is not compatible with an independent monetary policy. For example, the central bank cannot set the interest rate at a level that is different from that on the currency to which the domestic currency is pegged, otherwise opportunities will be created for riskless arbitrage profit. Then we have the Lucas paradox that capital does not flow from developed countries to developing countries despite the fact that developing countries have lower levels of capital per worker. This paradox can be explained easily in terms of the phenomenon of home bias, which will be examined in Chapter 3.

## 1.7 WHAT IS NEXT?

In this chapter the preliminaries have been presented: the concepts of puzzle, myth and paradox, both in general terms and what they mean in economics and finance, where paradoxes are essentially puzzles. We considered some paradoxes, such as the Downs–Thomson paradox, the Tullock paradox, the Easterlin paradox, the Gibson paradox, the Giffen paradox, and others for which some simple explanations were suggested. We also considered the meaning of myth in general and more specifically in economics. We will later see some interaction between myths and puzzles, in the sense that some puzzles are based on myths, and that myths can arise from firm belief in puzzles, no matter what plausible explanations are presented to solve these puzzles.

In the next eight chapters we will consider in detail some puzzles and myths. In Chapters 2–4 we examine puzzles in international finance, international economics and macroeconomics, and finance, and argue that none of them is a puzzle. In Chapters 5–8, some myths (which, for some reason, are considered by some economists to be facts of life) are analysed in the fields of econometrics, laissez-faire, financial economics and macroeconomics. In Chapter 9, the mother of all myths, that the British royals attract tourists and pay for themselves, is debunked. In Chapter 10 we consider puzzles based on myths as well as a hypothetical puzzle, a silly puzzle and a dumb puzzle.