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Diagrammatic economics

A review of Blaug, M. and Lloyd, P. eds. *Famous Figures and Diagrams in Economics*, Cheltenham, U.K.: Edward Elgar, 2010, pp. xvii, 468.

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Introduction

This book is a remarkable collection of figures and diagrams that have been prominent in the history of economics. In 58 chapters contributed by over 50 authors, it reproduces with expert commentary 58 named diagrams, dating from as early as 1758 to as recently as 1996. A further 89 diagrams have been used in commentaries on the 58 named diagrams. A splendid 23 page introduction by the editors provides an account of the origins of the diagrams and their places in the history of economics, together with a useful chronology of their discoverers and an appraisal of the contributions. The collection could be described as a celebration of over 200 years of geometrical skill and achievement in economics.

Part I: The purpose of diagrams

For those who love diagrams for their own sake, and who think that diagrams have made a significant contribution to the progress of economics and the progress of human welfare, this book is exciting and essential reading. But while acknowledging and admiring the scholarly expertise of the contributors and the effort of the editors in organising such a massive undertaking, its publication might be an opportune occasion to reflect on the purpose and achievements of diagrammatic economics and to ask whether these diagrams have made any contributions to economic thought that would not have been made just as effectively by a non-diagrammatic use of words, or whether they are merely gimmicks.

Most of the contributions to this Picture Book of Economics have certain features in common. The contributors have reproduced and explained the diagrams, but with possibly a few exceptions seem to have assumed that the diagrams are self-justifying and have made worthwhile contributions to the science of economics. There is a general absence of rigorous critique of the diagrams and few attempts to assess their practical usefulness. The contributors were probably not requested to do so and therefore could not reasonably be criticised for not doing so. Their collective achievement in presenting and explaining the diagrams is already an original contribution to the literature. The tenor of the book is therefore understandably uncritical or a-critical, but as in most areas of economics there are dissident voices which would like to be juxtaposed to this assemblage of praise for the diagrammatizers of economics.

The introduction makes a threefold claim: diagrams “have played a central role in the development of economic theory”; they “have been a major vehicle of discovery of economic concepts and propositions”; and “have excelled as an expository device”. Such statements are sure to be condoned by all diagrammatizers, but also sure to infuriate all who abhor diagrams and who see diagrams as being largely responsible for the current distressed state of economics. We are told “figures are part of the basic textbook of modern economics”, and assured that the diagrams selected for inclusion are commonly regarded as essential knowledge and “cover a large part of mainstream economic theory and analysis”. Such

statements are presumably intended to be taken as an endorsement and justification of diagrammatic economics. An alternative view is that they should be interpreted as an indictment of what currently passes for mainstream economics and is a cause for regret rather than congratulations.

Although the editorial introduction claims that figures and diagrams have been used in economic theory “as a device to discover economic results” and “to prove some results”, it somewhat undermines this claim when it adds that “it is not easy to uncover the role of figures and diagrams in the discovery of results”, and when it states that although Alfred Marshall was an advocate and frequent user of diagrams, he warned that “graphical illustrations are not proofs. They are merely pictures corresponding very roughly to the main conditions of certain problems”. The credibility of diagrammatical economics is further undermined when we read that the “use of geometry as a device for discovery and proof has declined in recent decades.” Opponents of the diagrammatization of economics will no doubt hope that the decline will continue and that this volume, rather than being a celebration of diagrams past, will be a shrine of remembrance, or a mausoleum, or an addition to the already overstocked museum of economic antiquities and misdirected efforts.

The claim that diagrams “have been a major vehicle of discovery of economic concepts and propositions” is debatable. To be believable it would need to be substantiated by particular examples. Concepts and propositions are conceived and can lead to diagrams, but is the reverse likely? Has it ever happened, could it ever happen, that the diagram precedes the concept, logically or temporally? We are told that the Laffer Curve was first drawn on a restaurant napkin. Was it only after doodling it on the napkin and because of the doodling that Laffer conceived the idea that beyond a certain point further increases in the tax rate will reduce the total tax revenue? In how many of the 58 diagrams in this collection has the diagram being “a major vehicle of discovery” of the concept? Is there compelling evidence that any one of the diagrams preceded and caused its relevant concept?

The unspoken assumption underlying most if not all of the contributions to this collection seems to be that if it is a diagram, it is good. The book's aim is to show the role of diagrams “in the development of economic theory”, but does not consider the possibility that “development” does not necessarily mean beneficial change. Dissenting critics would want to argue that the “development” of diagrammatic economics has been a regrettable digression in the history of economics and has retarded rather than advanced the science of economics.

Even more debatable is the claim that diagrams have a valuable pedagogic function and “have excelled and continued to excel” as an expository device. The editors ask rhetorically: “What teacher of economic theory has not seen the dawn of understanding come over students when, failing to understand the exposition of some complex model in algebra or calculus, they are presented with a simple illustration?” If some teachers economics have witnessed such an awakening, they are indeed fortunate, especially by contrast with other teachers who, when they present a diagram, encounter not the dawn of understanding but the twilight of unknowing. If this magical awakening of the spirit does occur, does it justify the use of diagrams, or does it merely prove that the diagram is less obscurantist than the algebra and calculus? For every student whose awakening dawn comes through diagrams there is another for whom diagrams are a crepuscular confusion. If the diagrammatic exposition is clearer than the verbal exposition, does this mean that diagrams are better than words, or could it merely be a reflection of the inadequacy of our ability as lecturers to express ourselves clearly in words? Do we resort to diagrams because of our verbal incompetence?

It is claimed that diagrams are “much more than illustrations” and that “in many areas of economics the way in which economists understand economic concepts and propositions is through figures and diagrams.” But anti-diagrammatizers would argue that if it cannot be explained in words, it cannot be explained by diagrams, and if it can be explained in words, there is no need for diagrams. A possible defence of diagrams might be that they complement the words, and enhance the understanding; but a counter-argument is that diagrams in economics are beginning to supersede words. The question has to be asked: Would economics today be any worse off if economic diagrams had never been invented? Can we point to any diagrams in this collection that have materially advanced the cause of human welfare, apart from providing for the personal satisfaction and income of those who teach them? Are diagrams science-enhancing or career-enhancing? Has there been any significant real-world economic policy that would not have occurred were it not for an associated diagram?

There is no doubt that as intellectual exercises diagrams are excellent, but it could be argued that as aids to a better understanding of how economies work, they are about as useful as Sudoku; and that the profession has become self-hypnotized by diagrams, with its collective attention fixated on the captivating displays of lines and curves.

Nor should the opportunity cost of diagrammatic economics be ignored. If it occupies a large part of mainstream economics, what areas are being crowded out of the economics curriculum and neglected?

There is one undeniably useful function of diagrams in economics, and that is, as prosthetic devices for maintaining law and order in the classroom. All economics lecturers, even those of us with outstanding oratorical skills and charismatic personalities, know that when the attention of a class of 1000 restive students of microeconomic theory begins to wane, the only way to regain it is to show a diagram. For most lecturers, the idea of trying to conduct a 50-minute lecture without any diagrams is unthinkable; the concept of a non-diagrammatical economics is a self-contradiction. The use of water cannon is no longer socially acceptable as a means of crowd control in the lecture theatre, but diagrams are just as effective.

Another associated and undeniably useful function of diagrams, another reason for their creation, and another reason for the reluctance of lecturers to abandon them, is the ease with which they can be assessed in assignments and examinations. An experienced eye can judge and annotate a diagram in seconds, compared with the agony of wading through a 1000 word essay. The permanence of some diagrams adds further to their charm. Once the profession has accepted a standard presentation of the diagram, it becomes immutable and can be wheeled out year after year to each successive cohort of students without revision and without any adjustment of overheads, slides and power points. It is hard to imagine the cries of shock and horror if diagrams in economics were abolished. They are the bread and butter of the academic economist, the lecturer's friend and helper; and life without them would be far less comfortable.

While recognizing and commending the undoubted skill that goes into the creation and presentation of diagrams, is there are not a tendency in some textbooks to go beyond admiration into adulation, veneration, and adoration, with some diagrams being extolled and held aloft as quasi-religious icons, as uplifting symbols to inspire faithful devotees and convert infidels? Christianity has its cross, Islam has its crescent, Communist Russia has its

hammer and sickle, Nazi Germany has its swastika. For some members of the sect of economists known as classical Marshallians, the Marshallian cross becomes a talismanic symbol of their faith, a banner which sums up all they hold dear, and under which they serve and fight the good fight.

In reading the 58 chapters of this book, one has the impression that, at least in some cases, the presenters are more enamoured of the diagrams than the concepts behind them. Instead of merely being the medium by which the concept is conveyed, the diagram has become the message. It is given more attention than the idea; and for some diagram devotees is more interesting and more important than the idea. Were it not for their pictorial representation, some of the ideas would have been relatively insignificant or trivial. Arguments about the diagrams can generate more discussion and debate than arguments about the concepts, and become substitutes for arguments about the real world.

In the diagrammatic way of thinking, the diagram takes causal priority over the reality. We forget that the diagram is merely a representation of reality, not reality itself. The diagram usurps the concept and the reality. For those brought up in the diagrammatic world, arguing by diagrams seems to be more convincing than arguing by words; they appear to assume that no argument can be conclusively settled without recourse to diagrams.

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The urge to mathematize and diagrammatize is extremely strong, and the self-satisfaction from successfully doing so is very rewarding, so much so that the drawing of diagrams becomes an end in itself, irrespective of whether the process is at all conducive to the progress of the human condition. Diagrams are presumably conceived as a means towards the end of better understanding, but have become the end. Their passionate practitioners believe it is impossible to do proper economics without diagrams; that diagrams are not only necessary but also sufficient. You cannot say you have solved the problem until you have drawn the diagram. And when you have drawn the diagram, you have done all that needs to be done. The aim seems to be to express all economic problems as problems in Euclidean geometry, and all capable of solution. It is believed that if the problem cannot be expressed diagrammatically, it cannot be solved; and once it is expressed diagrammatically, it is solved. To diagrammatize a problem, is to solve it. Every new diagram is seen as another step forward in the development of economics; the diagram is a sign and symbol of progress, and there can be no progress without diagrams.

Although the diagrams in this book have been neatly drawn and nicely described and some have been given an account of their genesis, there seems not to have been a serious attempt to subject them to a *cui bono* test. It is certainly true that **indifference curves**, for example, are “a fundamental expository tool of economics”, if by economics we mean “economics as taught in modern textbooks,” but would economics have suffered if indifference curves had never been invented? To push the utilitarian criterion even further, have economic conditions generally benefited from their invention?

Critics will ask whether diagrams are a help or a hindrance to the progress of economics, but for convinced diagrammatizers this is a non-question. In their view, economics is diagrams; the diagrams contained in this publication constitute the intellectual structure of economics; the ability to comprehend these diagrams is what differentiates the economist from the non-economist.

Geometry is fun, for some; and those who think otherwise should tolerate and respect it as a pleasant pastime, but what the anti-diagram people do not like is a tendency of diagrammatizers to command the high intellectual ground; to strive for hegemonic domination of the curriculum; to claim that modern economics is essentially mathematical and diagrammatical; and that any other approach is sub-scientific and not worthy of being called proper economics.

There is no doubt that some students enjoy diagrams. They encounter diagrams at their first contact with economics, and come to expect them at every stage of their economics education. If they have done well in reproducing diagrams in essays and exams, they are disappointed if lectures are devoid of them. They go away feeling disillusioned and cheated. Diagrams also have a therapeutic function. They convey a sense of Euclidean certainty, of academic respectability and of scientific precision, thus providing a security blanket in an uncertain world, and satisfying a psychological need, even though economics itself has little or no need of them. But does a liking for diagrams prove they are a necessary part of an economics education, or is it merely recognition of the power of geometry to provide intellectual satisfaction? Are we teaching students economics or geometry? For as long as geometers continue to exist, some will not be able to resist the temptation to turn economics into geometry, confident they are making it more scientific, and ridding it of the vague and ill-defined tools of communication known as words.

The attraction of diagrams can be attributed, at least in part, to the fact that with television, and telephones that provide pictures as well as words, and advances in graphic arts, we live increasingly within a visual culture, which in itself is perhaps no cause for complaint, but which becomes worrying when it begins to erode and replace verbal culture. Students in lecture rooms will sit, more or less patiently, more or less politely, waiting for the words to stop, with pen in hand, without taking a single note; but as soon as a diagram appears on the screen, the pens come into action. Words are regarded as unimportant preliminaries to the important diagrams.

The editors of this collection are of the view that multi-coloured diagrams are being used “to great effect” in modern textbooks. Perhaps Marshall’s warning that diagrams are “merely pictures” would have been less dismissive if he had seen them in glorious technicolour. Those who dislike the use of diagrams in economics would regard their coloured proliferation as yet further evidence that Picture Book Economics has become a substitute for verbal analysis; and that in economics words are being submerged by pictures. Textbook writers compete with one another to see who can include the most diagrams in the most colours.

Part II: Useless and redundant diagrams

Turning attention now to an assessment of some particular diagrams in this collection, it could be argued that, when subjected to critical appraisal, some are theoretically deficient; some seem to be useful in theory, but useless in reality; others are redundant, either because they are too trite to be taken as serious contributions or because the concept being portrayed has been adequately enunciated long before the diagram was invented.

A rare contribution in this collection to have been given a non-eulogistic treatment, and to have received an objective appraisal of its validity and usefulness is that of Yew-Kwang. His six qualifications to the **Harberger Triangle** raise serious doubts about its academic status.

They amount to a denunciation of the Harberger Triangle as a valid tool of economic policy. Although Yew-Kwang does not state that conclusion in his six qualifications, he argues that even if taxation means a loss of surplus "it does not follow that there should be no taxation or less taxation", because the tax revenue could finance public goods which create consumer surpluses and offset the loss caused by taxation.

A similar tone of dissension is evident in the contribution by Richard Lipsey, who criticizes the Harberger diagram for "paying no attention to the effect of policy changes on the distribution of income", and who believes that many economists "prefer conclusive results that suppress inconvenient truths over inconclusive results that take account of these truths".

A critical, as well as expository, approach was also taken in the contribution on **cobweb diagrams**. The author's incisive assessment concludes that the cobweb diagram is "fatally flawed as a theory of agricultural price movements", and is not supported by empirical evidence. It has nevertheless had a "profound and lasting influence" on the development of economic models. This must surely be convincing proof of the power exerted by diagrams, and their founders and teachers, in influencing curriculum design; a power that persists irrespective of the intellectual and empirical merit of the ideas the diagram is purporting to illustrate.

The enthusiasm that surrounds some diagrams and the exalted status they enjoy in the corpus of economic theory seem to be out of proportion to their role as progenitors of economic wellbeing. These diagrams could be categorized as useful in theory, useless in practice. The **homothetic function** is one such. It is said to be "important to international trade", but surely this confuses trade with the theory of trade. But it could also be said that international trade itself would not suffer if homothetic functions did not exist; and that when businessman are negotiating an import or export deal, or when government officials are making decisions that affect exchange rates and the balance of payments, it is very unlikely that any of the decisions would be based on homothetic functions.

Offer curves could also be placed in this category. They are said to be "immensely useful" to international trade theory, but how useful are they to trade? Does anyone actually engaged in international trade rely on them? One suspects that their main function and reason for being is as a starting point for the development of even more sophisticated diagrams of trade, not for the development of trade itself.

The same could be said of **cost curves**, described as "a staple part of the curriculum of undergraduate microeconomics". Expertise in drawing and manipulating cost curves will be well rewarded in academic examinations and academic careers, but how many company directors draw cost curves before making price and production decisions? Once they escape from there neoclassical education, they discard the toys of their youth. If diagrams are so important in economics, how do you explain that with the exception of school and university teachers, they are rarely used in the real world? Rather than enhancing economics, it is possible that the diagrammatic approach, so beloved and vaunted by some, has in fact contributed to current disillusionments with economics.

The **optimal tariff diagram** provides yet another example of the futility of much diagrammatic endeavour in economics. That diagram is said to appear in "nearly every modern textbook on the theory of international trade", and to provide governments with "the necessary formulae" for setting an optimal tariff to maximize their economic well-being. The ingenuity and

cleverness of the diagram can only be matched by its uselessness, in a world moving towards free trade and the abolition of all tariffs. The futility of the diagram is even more pronounced when it is acknowledged that, if two trading partners adopt an optimal tariff, they could both possibly be worse off than under free trade. This diagram persists in modern textbooks because of its useful role as a mental exercise and student minding activity.

There are diagrams in this collection which could be labeled superfluous or redundant. One reason for their superfluity is that the words explaining the concept behind the diagram are just as clear as the diagram, or even clearer. Any attempt to praise or defend the role of diagrams as expository devices in economics would need to show that diagrammatic presentation is superior in that respect to verbal explanation. If it cannot be shown to be even slightly superior, does this not mean that the diagram is a waste of time, effort and space? If the verbal explanation is not expressed clearly, the diagram could well be superior as an expository device; but if the verbal explanation can stand alone as an adequate means of communication, the diagram becomes a mere visual embellishment, lacking any substantive function. A case in point in this collection is the chapter on **backward-bending labour supply curves** by John King. This knowledgeable account of the history and significance of the concept is so lucid, it renders its accompanying diagram redundant.

Another reason for placing the backward-bending supply curve of labour in the redundant category is that the concept underlying it is far from new. The concept was not brought into being by the curve. It was, for example, stated as long ago as 1798 by Malthus, who announced it not as a triumphant discovery, but as a commonsense observation. In discussing proposals to increase the level of poor relief, he said: “the receipt of five shillings a day, instead of 18 pence, would make every man fancy himself comparatively rich, and able to indulge himself in many hours or days of leisure. This would give a strong an immediate check to productive industry” (*Essay on Population*, 1798). Has the portrayal of the backward-bending supply curve of labour contributed any advance to the progress of economics, or did Malthus in 1798 say all that needs to be said on the matter?

Malthus might also be cited in reference to the **Kuznets Curve** and the **Laffer Curve**. These two curves add little to the concepts they purport to explain, and these two concepts a little more applications of the methodological principle called by Malthus the “doctrine of proportions”, according to which the relationship between a determining variable and the determined variable in economics is, more often than not, parabolic, and the optimum position is a balance or middle way between extremes.

The **UV curve**, showing figures for unemployment and vacancies, is another example of a curve that is quite redundant. It is obviously important to know whether unemployment figures are higher or lower than vacancy figures, with the former situation indicating a slower demand for labour and an actual or potential recession, and the latter situation, indicating a high demand for labour and an actual or potential expansion; but once these statistics are known, does the drawing of the curve add anything of theoretical or policy significance? Its function would appear to be merely decorative.

The **rent seeking diagram** is yet another instance of diagram redundancy. The entry in this collection provides an exposition of what is meant by rent seeking and of how government attempts to regulate the free market might involve a high expenditure of resources without a proportionate increase in output. The verbal argument may or may not be convincing, but its plausibility does not appear to be in any way enhanced by the accompanying diagrammatic

argument. The diagram seems to be designed to attach academic respectability to a thesis, in a world where academic respectability is measured by the use and complexity of diagrams.

The same could be said of the **circular flow diagram**. As Roger Backhouse points out, the concept of circular flow lends itself admirably to a diagrammatic exposition, and this has been encouraged recent years by the development of a "visual culture" throughout the wider community, and by improvements in the art of graphic design. The textbook ubiquity of the circular flow diagram is evidence of its popularity and usefulness as a teaching device, or but this is probably as much due to its simplicity as to its intellectual content. Some would say that, by comparison with most of the diagrams in this book, it is a chart rather than a true diagram. The concept of circular flow is simple, obvious and easy to explain. Its chart is surplus to requirements.

Diagrams can also be deemed superfluous because of the trivial nature of the concept or theory being diagrammatized. Some of the diagrams in this collection and some of their underlying concepts seem to be less significant than claimed or suggested. Some indeed are so obvious as to be best described as trite. **Engel's Law** might be one such. Do we need a law and a diagram to know that expenditure on food declines as a proportion as household total expenditure increases, or that family size and composition affect expenditure patterns. If Engel's Law had not given rise to a diagram, it would probably never have been deemed worthy of mention. Its fame as a proposition and its position in the curriculum and textbooks of economics seem to have come from its diagram.

As a final example of an unnecessary diagram, we could refer the **IS-LM diagram**, which after generating an industry of academic commentaries now seems to have been rendered redundant, given that its creator acknowledged its limitations and expressed amazement at the amount of attention it has generated. It is a sobering reminder of the power of diagrams to live flourishing and self-perpetuating lives of their own, independently of the intellectual merit or validity of their underlying concepts.

Part III: An anti-diagrammatic conclusion

The modern economist's preference for diagrams over words would have been understood and applauded by the professors of the School of Languages in the Grand Academy of Lagado in Balnibarbi. In Jonathan Swift's *Gulliver's Travels* (1726) the professors aim to improve their language by abolishing words and by using implements to express themselves. Each person would carry sacks of implements, and converse with one another by holding up the necessary implement. As Gulliver noted, the inconvenience of this system is that you could be obliged to carry great sacks of things on your back, unless you could afford strong servants to carry them. The professors of Balnibarbi had apparently not thought of using diagrams as substitutes for words.

Does this collection of diagrams represent the benchmark of competence in economics, and the standards that our students should aim to attain, so that they too can be deemed worthy of the name "economists"? Or is it sad evidence of how economics has lost its way and become swallowed up by geometry? Do these diagrams constitute the high point in the evolution of economics, or are they a pointless exercise, a party game, a cosmetic embellishment, or the decorative bunting of economics?

But for all enthusiasts of diagrams and for all who see their role as inspiring the next generation of economists with a love of diagrams, so that they in turn are inspired to create even more diagrams and to shunt the car of economics even further on to the diagrammatic track, this publication will be a memorable iconoplastic achievement.

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