

Supply and demand models – the impact of framing

Stuart Birks [Massey University, Palmerston North, New Zealand]

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Abstract

Supply and demand models have been extensively used to give useful insights. As with any theoretical approach, there are some aspects which are emphasised, some which are ignored, and others given a distorted representation. An awareness of the framing of the theory is useful for identifying additional aspects to consider. This paper illustrates some of these points. In particular, consideration is given to: limitations of static and comparative static analysis; the nature of available information and implications of decisions from limited information; the extent to which decisions/allocations are determined outside freely operating markets; homogeneity assumptions; and the nature of competition.

1. Introduction

Economics places great emphasis on models. There is a very real danger that people come to see economic theories and models as representations of reality. This can result in an inflated view of our understanding and a belief that questions can be addressed through use of these theories and models alone. Many research articles consist primarily of the estimation of a model. Some introductory textbooks describe the conclusions drawn from basic models as if they are equally valid in the real world (Mankiw, 2012). Concerns have been voiced that this approach may be too narrow. As one recent attempt to make this point, Minsky (2008, p. 109) talked about theory serving as both a lens and a blinder. This means that it enables us to see certain things, but the framing of the issue actually prevents us seeing other things also. He drew on Tobin to highlight the significance of this for policy.

“James Tobin, who was a member of the Council of Economic Advisers during President Kennedy’s first two years in office and who received the Nobel Prize in 1982, noted that ‘The terms in which a problem is stated and in which the relevant information is organized can have a great influence on the solution.’ But the way ‘a problem’ is stated and the identification of ‘relevant information’ reflect the economic theory of the policy adviser. That is, the game of policymaking is rigged; the theory used determines the questions that are asked and the options that are presented.”
(Minsky, 2008, p. 110)

This paper uses the basic supply and demand model to illustrate some of the possible pitfalls of this way of thinking, indicating how they may be avoided by a recognition of framing. This has been defined in a media context as “selection, emphasis, exclusion and elaboration” (Severin & Tankard, 1997, p. 320). It is important, and related perspectives can be found in other disciplines, but its significance is hidden to many economists. Dow (2012, p. 49) uses one overlapping concept in her critique of economics when she talks of a “worldview”, the broad structure around which a person’s perceptions and expectations are organised. In discourse analysis Fairclough (1995) refers to “ideological-discursive formations” (IDFs), language and structures, which groups may use to define debate. If a particular IDF dominates to the exclusion of others, it may be seen as the norm rather than as a particular

perspective. Some conventional approaches within economics may be questioned so rarely that they have achieved the status of worldview or IDF.

One worrying aspect of much contemporary economics research is the approach where, when analysing an issue, the very first step is the selection of a model. After this the analysis is undertaken, given all the constraints that the model contains. The results are then considered to be directly applicable to real world situations. This is very restrictive as Keynes himself noticed, given his suggestion that we should be aware of the reserves, qualifications and adjustments that are also necessary in the application of such thinking (Keynes, 2007, pp. 297-298).

Even now, when many aspects of mainstream economics are being challenged, people who are attempting to provide an alternative to the mainstream often aim to provide a basic model, just with a different choice of variables or generalised functional relationships. They are still constrained by the model structure.

By contrast, there are some outside economics who would argue that the relationships they are dealing with are so complex that generalised modelling is not possible. These are two extreme perspectives. A middle ground can be found in the suggestion that a diversity of approaches and awareness of local context is important for understanding human behaviour (Dow, 2012; Guba & Lincoln, 1994; Stringer, 2007). Hodgson has made a similar point:

“While mainstream economic theory has long been engaged in an attempt to place economics on secure and individualistic microfoundations, it was quickly realized that the potential diversity among individuals threatened the feasibility of this project. Many types of interaction between individuals have to be ignored to make the analysis tractable. Indeed, it was not easy to develop a composite picture from a diversity of types of individual agent.”
(Hodgson, 1997, p. 132)

In this paper I aim to indicate factors for consideration in such a middle ground. To this end, I take one of the most fundamental economic constructs, that of supply and demand. By that I mean the conventional representation of a market using a graph of price against quantity with a demand curve and a supply curve. The next section outlines some of these factors.

2. Using a supply and demand model

This is probably the most basic and well known economic model, so much so that we may not consider its limitations. Here I shall discuss a few.

2.1 Static analysis

Note that the supply and demand model is, like much of economics, based on static analysis. Consequently the focus will be on the market equilibrium. It is based on the idea that you have a scenario within which you can have as much costless adjustment as required to achieve some final end state which will be the equilibrium (issues of existence and uniqueness aside). This does not reflect the real world. In reality, there is a starting point, A. This is more than just an initial resource endowment. It also specifies an application of those resources, for example producing and consuming goods and services at some rate of output (as we are actually moving through time). There is also a path to be taken to the endpoint.

This is important. Consider comparative static analysis. Here two static solutions, B and C, are compared. One may be considered as more desirable than the other. However, this does not necessarily mean that it is desirable to achieve either of those particular outcomes. Nothing is considered about where we are starting from, how long it will take to get to either of those outcomes, and what the adjustments are on the way. There are costs that should be considered going from state A to B or A to C, rather than simply comparing possible options, B and C. There is also an issue of path dependence. In other words, where we can get to and how we get there depends on the starting point and the particular journey that we are taking. Consideration of a path through time highlights a particular aspect of the concept of equilibrium. In reality we are not operating in discrete blocks of time. However, equilibrium is a construct which arises from discrete perspective. We could perhaps alternatively think of a “steady state”, but could involve an ever-changing group of participants. Marshall (1920, Book V) discussed problems with the concept of market equilibrium at length, including differences in adjustments possible according to the time allowed and some possible implications of actual trades at various high or low prices before any stable price is determined.

There may also be a moral dimension to consider. The focus in economics on end points without regard for the means of attainment of those end points has been criticised using the label, “consequentialism”:

“In consequentialism, the consequence of an action justifies the moral acceptability of the means taken to reach that end. The results of actions outweigh any other consideration; in other words, *‘the end justifies the means.’* Jeremy Bentham was an early and influential advocate of utilitarianism, the dominant consequentialist position. A utilitarian believes in ‘the greatest happiness for the greatest number.’” (PHG Foundation)

So some important issues are excluded from consideration when using static analysis.

2.2 Long run and short run

Under static analysis it could be considered that there are short-run and long-run positions which are just solutions to differently specified situations. This distinction is less clear if we take a perspective which includes processes of adjustment. We can see this if we consider the view which presents a long-run outcome or path and short run fluctuations around this long-run position. This is often described using the metaphor of a pendulum. However the long-run position may well depend on the path that we are taking and hence the short-run situations that we are passing through. Path dependence means that short-run effects can have long-run implications. Instead of a pendulum, consider a rectangular grid of roads. You are driving along a road, then take a left turn, followed by a right turn. The sum of these two short-run effects is that you are still going in the same long-run direction, but on a different road.

To give an economics illustration, short-run fluctuations of construction affect the overall stock and age of housing and other building, the age and availability of skilled construction workers and construction industry capacity in general. Similarly, path dependence may be important in macroeconomics, affecting investment patterns and labour force size, training and experience. This indicates that it may not be enough just to consider a move to an equilibrium. A move to a short-run equilibrium may be one step on the way to a long-run

equilibrium, the position of which is influenced by the short-run equilibrium and the adjustment path (including disequilibria).

2.3 Theories behind supply and demand

Economists commonly consider the theory of consumer behaviour as underpinning the demand curve. This is not a requirement, but it is part of our rhetoric. However, the economics approach to consumer behaviour is highly simplified. There are many marketing texts on consumer behaviour. To take one, Schiffman, et al. (2008) dismisses economic theory in a few lines:

“[M]arketers realised that consumers did not always act or react as economic theory suggested they would. By ‘economic theory’ we mean the traditional economic concept of decision making, where the maximisation of economic utility or satisfaction is considered to be rational.” (Schiffman, et al., 2008, p. 11)

The text runs to over 650 pages and presents theory and evidence on numerous nuanced aspects of demand. Much of the material may be controversial, just as there are alternative theories in economics. It does suggest the possibility of many important influences being overlooked or oversimplified by economists, as illustrated in Figure 1, Schiffman et al.’s “Simplified model of consumer decision making”, below. How do we explain this to our students who have covered such alternative material elsewhere?

The theory of production and the firm underpins the supply curve. It could be considered a Claytons theory of the firm, what we look at when we don’t have a real firm to consider. If we start by using the theory, we are essentially constraining the evidence to fit within the theory.¹ This impact of framing has long been recognised:

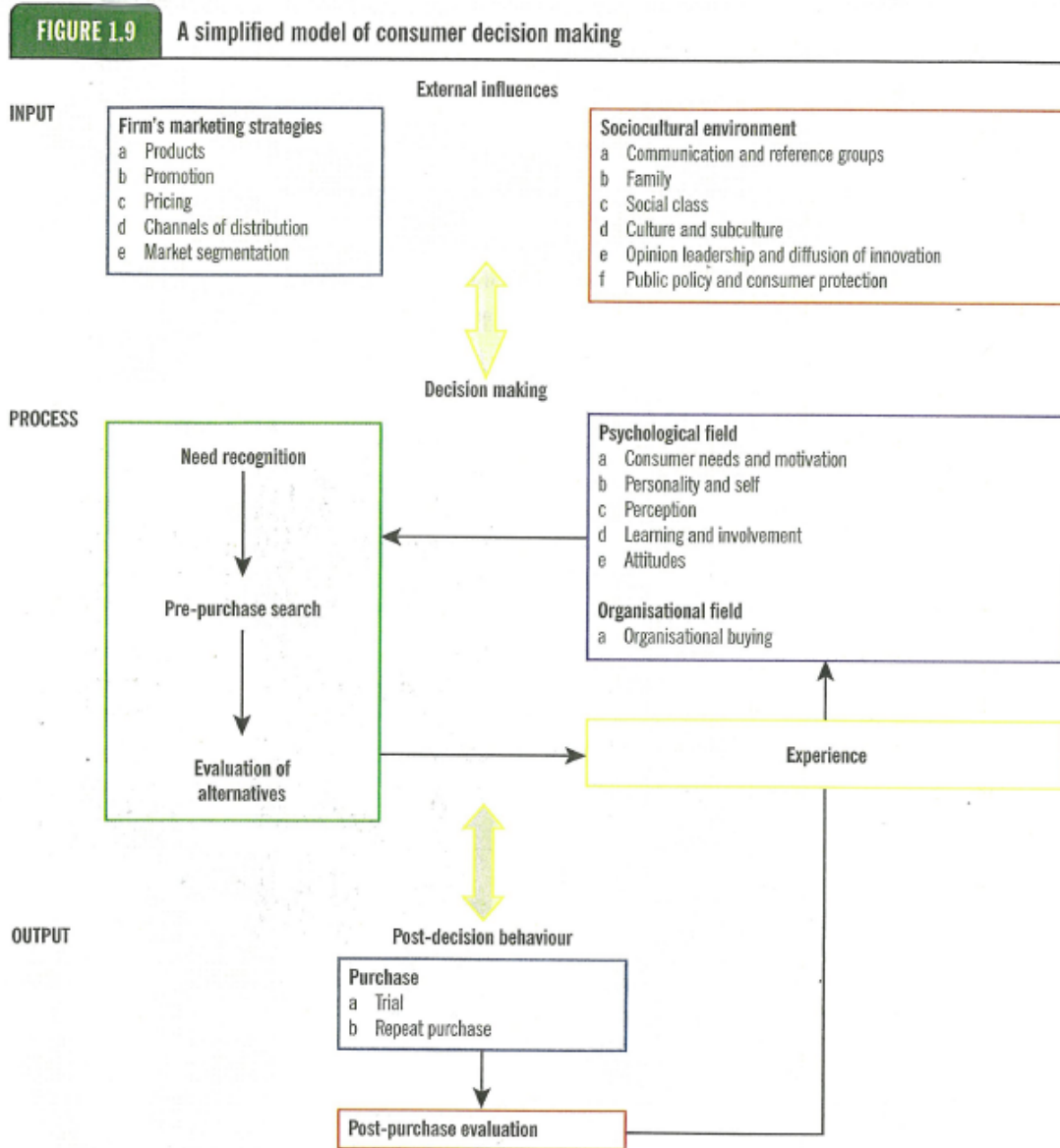
“When examining normal science...we shall want finally to describe that research as a strenuous and devoted attempt to force nature into the conceptual boxes supplied by a professional education.” (Kuhn, 1970, p. 5)

It should not be assumed that these conceptual boxes always suit the situations and problems under examination. Tony Lawson, a persistent critic of mainstream thinking, emphasises its reliance on an “atomistic” approach based on “items which exercise their own separate, independent and invariable (and so predictable) effects (relative to, or as a function of, initial conditions)” (Lawson, 2003, p. 16). This questionable assumption permits us to model competitive situations with the keystone finding that it is beneficial for all if individuals pursue their own self-interest. Sennett challenges this perspective, suggesting that cooperation is important even for this structure:

“Cooperative exchanges come in many forms. Cooperation can combine with competition, as when children cooperate in establishing the ground rules for a game in which they then compete against one another; in adult life this same combination of cooperation and competition appears in economic markets, in electoral politics and in diplomatic negotiations.” (Sennett, 2012, p. 5)

¹ The heavy reliance on econometrics as a research method could also be criticised for the same reason.

Figure 1



Source: P.14 of Schiffman et al. (2008)

We can think of other examples that illustrate interdependence in individual decision making. Consider, say, a decision as to which film to see or which restaurant to go to for a meal. These are often joint decisions and may override individual preferences in favour of group agreement.

Sennett writes about broader social developments in recent decades. He gives grounds for economists to question the uniformity of purpose assumed for firms in traditional theory and

raises questions about decisions that are made outside of the market even in market economies when he writes:

“Changes in modern labour have in another way weakened both the desire and the capacity to cooperate with those who differ. In principle, every modern organization is in favour of cooperation; in practice, the structure of modern organizations inhibits it - a fact recognized in managerial discussions of the ‘silo effect’, the isolation of individuals and departments in different units, people and groups who share little and who indeed hoard information valuable to others. Changes in the time people spend working together increase this isolation.” (Sennett, 2012, p. 7)

It may be that the atomistic approach in economics, by being blind to the importance of such interactions, has played a part in the development of these changes.

2.4 What might actually be happening?

The theory assumes the availability of information about supply and demand curves. However this is not what we tend to observe. At the very best, at any one time we are simply observing one point in the market, giving price and quantity. For a participant in a market, whether in terms of demand or supply, even this information may not be clear. It is even less clear whether the market is at equilibrium. Let us first consider the issue of equilibrium or otherwise, then turn to the information available to participants when they make decisions.

Let’s assume (optimistically) that we can observe a price-quantity point. What we are likely to see at best is what some call the short side of the market, the side where the trades actually occur. We don’t observe excess demand. We don’t observe excess supply. It may be that those whose plans are not realised are aware of their position and can revise their plans, allowing some market adjustment to occur. However we economists, looking on, may not be able to observe this.

There are some markets where willingness to buy and sell can be observed, if imprecisely. A notable example is the market for labour, with unemployment and vacancy data being regularly made available. There can also be some indications in housing markets, at least in relation to supply, although an asking price may not be a good measure of the price a seller may accept. Central to the description of the labour market is the search process, and search may be a characteristic of many markets. It may be tempting to suggest that the market is in some sort of equilibrium if unemployment numbers are roughly equal to vacancies. This would be incorrect. If the time taken for search on the demand side is not the same as time taken for search on the supply side, then you will require different quantities on supply and demand for these to be able to match up overall. For example in a simplified structure with fixed time requirements, if it takes two weeks to fill a vacancy but only one week for an unemployed worker to find a job, with a constant flow of placements and rate of unemployment you would observe twice as many vacancies as unemployed.

Now consider the information available to participants when they make decisions. The market is a “flow” of trades through time, rather than a collective exchange in a timeless environment. In economists’ representations of a market, we aggregate over time. It is not so clearly delineated for participants. We don’t have the Walrasian auctioneer or a tatonnement process taking place before you have the one-off allocation of equilibrium trades. Time does matter.

People are gathering information and are making purchase and sale decisions throughout the period of the market. This bears little relationship to implicit assumptions in standard economic theory that time can be ignored and it is costless to match up the supply and demand. In reality, traders and purchasers are progressing through the period of the market and the exploratory process in the market is observed through actual trades or actual declines to trade, and these are in many cases irreversible. So if a supplier is selling at too low a price, they cannot then increase the price to people who have already bought the product. Alternatively, if the price offered is too high and sales are lost, they probably will not be able to regain those same lost sales through later lowering the price. Therefore, the number of trades that occur at any actual equilibrium price could be very small if there is some fluctuation occurring during the period of market.

How well do the signals from the potential buyers get through to the potential sellers? Primary signals for a seller are the volume of sales and customer requests for items. If stocks sell out quickly, this suggests excess demand. However, the market does not consist solely of the buyer and producer in direct contact. There are intermediaries, including the wholesaler and the retailer, and possibly additional levels also where there are intermediate goods in the production process. There can be barriers and long delays in conveying information along these chains.

Mention should be made of the analysis of exit and voice (Hirschman, 1970). Standard economics approaches to markets emphasise exit, but voice is an alternative source of information. If potential purchasers do not think an item is available in a particular store (or at all), they may not seek it. People in the store will have little idea of that potential demand. Voice may be important in many additional ways, given new information technology and the ability of individuals to publicly present their views and experiences through the internet. These developments are potentially highly significant for the nature and functioning of markets.

Behaviour out of equilibrium could be considered further. According to our theoretical framing, if there is disequilibrium, plans are not realised. If plans are not realised there is an incentive to change behaviour. Conventional supply and demand models assume that responses to unrealised plans will be in terms of quantity and price adjustments moving along demand and supply curves. However, participants in the market are not operating within our models. Possible changes in the real world are not constrained to lie within the parameters of the chosen models. Participants may have other options available, both in the short-run and the long-run. Instead of moving along imaginary supply and demand curves, people may respond through changes in some other variable, resulting in shifts in curves. In the case of excess supply, for example, unsuccessful sellers are unlikely to wait indefinitely for an opportunity to sell in a specific market if alternative options are available. The labour market gives well-recognised examples of this, with workers finding another type of job, or doing further education. Discouraged workers may also be invisible to the market, with a resulting loss of their market signal. Consequently the theoretical market forces that are said to give adjustment to equilibrium may not be effective in the way that is assumed in mainstream theory.

The strength of market forces depends on the extent of excess supply or demand, and this is ephemeral where exit is possible. Consider also the situation of price ceilings and price floors. Here price adjustment cannot take place. Do we then assume that participants continue indefinitely with plans not realised? This is unlikely to be the case.

In summary, consideration of information flows and of a broader range of possible reactions to plans not being realised would give a richer and more nuanced description of potential market behaviour, and hence of the operation markets out of equilibrium.

2.5 Only allocation through freely operating markets?

Another assumption that we make when we apply supply and demand to analyse issues, is that we can consider society operating through freely functioning markets. As Dixit and others have said, this isn't the reality that we face. First, there is a political as well as an economic environment operating. It can be very difficult to separate out government from markets.

“Markets and governments are both facts of economic life, and they interact in complex ways. We cannot find feasible improvements by wishing away one of the components.” (Dixit, 1996, p. xv)

Consider the size of government itself, the labour force it employs, the output it creates, the number of resources that it uses or has command over. The allocation of these is determined not just by market forces, but by political decisions and other institutional arrangements. Second, there are also many regulated transactions, not necessarily regulated by government, although this is also the case, but regulated through price schedules or other pricing practices, and through outlet restrictions by various brands. It is interesting that, for example, with electrical goods some suppliers will only supply to chains if those chains do not stock the goods of some other producers.² We might consider this to be counter-productive. However, we find it quite acceptable to have those restrictions for outlets such as McDonald's, KFC and Pizza Hut. We don't require each of those to stock the goods of their competitors.

So there are restrictions in terms of access to market. Similarly, many producers are operating through a whole distribution chain with wholesalers and retailers, and decisions are made by those other participants in the market. There is not a direct connection between the producers and the consumers. At those steps in the chain frequently pricing is not based on marginal cost, but rather it is set in terms of the percentage mark up, which leads us to question the extent to which marginal cost pricing, if marginal cost can actually be determined, is being used in practice.

Third, there are many nonmarket transactions that we should consider. Certainly within the government sector there are no effective markets operating for most resource allocation decisions, even though attempts have been made to set them up to some extent in the health sector, for example. There are difficulties when such structures are set up, and they're not necessarily the most efficient. If we look at private sector firms, then there are many situations where resources are allocated within firms without the use of pricing structures. We also have the possibility of transfer pricing, as has recently become topical with multinational firms such as Google, Amazon, Apple and Starbucks (Chapman-Smith, 2013). Hence there are many transactions that are taking place even within a market structure, where the allocation or pricing is not determined through markets. There are implicit pricing decisions being made

² “In a stinging attack on competitors, [chief executive Mark Powell], who moved up from The Warehouse divisional ranks two years ago, also told how the national chain had been the victim of anti-competitive behaviour from rivals. ‘The Noel Leeming purchase allowed us to get access to brands that would not sell to us because of pressure from other retailers,’ he said. ‘It’s all hush-hush but it goes on constantly in New Zealand because it’s a small country ... constantly!’” (Gibson, 2013)

within organisations. So even in a market structure, to suggest that this means that all resources are allocated through some market process and people are aware of the productivity, the marginal cost and the marginal benefits of each input, this also is incorrect. Keynes actually highlighted this sort of thing in his *General Theory*³. He was well aware that we should not be thinking of some pared down, simplified view of the economy as merely a collection of firms selling directly to consumers, with one item each and everything allocated through factor and product markets on the basis of competition and perfect information.

2.6 Some other points

a) Aggregation and homogeneity

As already discussed, the definition of a market for supply and demand analysis involves aggregation over time. There are also aggregations over space, and over type of good, service, or factor. Aggregation assumes homogeneity, with identical treatment of elements within an aggregate and different treatment of elements in another aggregate (such as a geographically adjacent area). The boundaries affect our analyses and the results obtained, although such a distinct dividing line may not be realistic.

This point aside, specific markets may possess their own characteristics. It is not one size fits all, even with supply and demand diagrams. We might have, for example, 2-sided markets, or multiple objectives. Firms are sometimes producing many different things. They might use some markets to provide a steady income, while taking more risks in others. At times a firm may experience cash flow issues, or questions of warehouse space, and some things happening in one market might have an influence on willingness to supply, or price, an activity in other markets. These things are not picked up in a basic supply and demand model. They are additional aspects which may have to be considered.

b) Imperfect competition

While the supply and demand representation is the common form chosen to describe a market, it is not suitable for imperfect competition where individual suppliers face downward sloping demand curves. Under these circumstances, the supply decision depends not just on price, but on the relationship of demand to price.

c) Non-price competition

The supply and demand model emphasises price as a determinant of both supply and demand, with other determinants being assumed away under the homogeneity assumption, or hidden either as additional explanatory variables or by being ignored completely.

³ "If money-wages are inflexible, such changes in prices as occur (i.e. apart from 'administered' or monopoly prices which are determined by other considerations besides marginal cost) will mainly correspond to the diminishing marginal productivity of the existing equipment as the output from it is increased. Thus the greatest practicable fairness will be maintained between labour and the factors whose remuneration is contractually fixed in terms of money, in particular the rentier class and persons with fixed salaries on the permanent establishment of a firm, an institution or the State. If important classes are to have their remuneration fixed in terms of money in any case, social justice and social expediency are best served if the remunerations of all factors are somewhat inflexible in terms of money. Having regard to the large groups of incomes which are comparatively inflexible in terms of money, it can only be an unjust person who would prefer a flexible wage policy to a flexible money policy, unless he can point to advantages from the former which are not obtainable from the latter." (Keynes, 2007, p. 268)

Nevertheless, non-price competition has long been recognised, not least with “the perennial gale of creative destruction” (Schumpeter, 1976, p. 84). Significantly for judgments on the desirability of specific outcomes in the market, Schumpeter also suggested:

“A system—any system, economic or other—that at every given point of time fully utilizes its possibilities to the best advantage may yet in the long run be inferior to a system that does so at no given point of time, because the latter’s failure to do so may be a condition for the level or speed of long-run performance.” (Schumpeter, 1976, p. 83)

Static analysis, with the suggestion that optimal outcomes are defined in that context, fails to pick up on this possibility. Some of the disequilibrium behaviours suggested in this paper may have important long-run implications. It may be fruitful to explore their significance for policy purposes.

3. Conclusions

One way to look at economic theories, models and concepts is that they provide a tool kit. They give representations which may serve as analogies which, on occasion, may assist in our understanding of the real world. However, we must guard against the very real danger of believing that our theories, models and concepts are the real world. Alternatively, we should not go to the other extreme of believing that it is not possible to construct any simplified representations to aid our understanding of the real world. There is a middle ground in which careful use of theories and models can be useful, as long as we are aware of the limitations of these approaches. The framing shapes what we see and what we fail to see. Consequently any analysis, if it is to be applied to decision making in the real world, must be subject to further reserves, qualifications and adjustments. It is important that we recognise these constraints. Specific, on-the-ground circumstances may be very important, and it can be dangerous to require descriptions of economic phenomena to fit our theory-based “conceptual boxes”.

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Author contact: k.s.birks@massey.ac.nz

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