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Sheila Dow’s Open Systems Methodology

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Abstract: This paper reviews Sheila Dow’s contributions to open systems thinking as a form of methodological argument and as an important foundation for pluralism in economics. It reviews the origins of her thinking in connection with her distinction between Cartesian/Euclidian and Babylonian thinking in the history of economics, discusses the further development of her views regarding open and closed systems in her 2002 Economic Methodology book and in connection with her ‘structured pluralism’ concept, discusses the 2005 paper co-authored with Victoria Chick, “The Meaning of Open Systems.” examines Dow’s and Chick’s view and critique of critical realism in regard to the relationship between models and theorizing and uses Piero Sraffa’s 1930s the open-closed distinction to provide a similar understanding of such boundaries and the relationship between models and theorizing, and finally comments on Dow’s contribution to open-closed systems thinking and pluralism in economics.

Keywords: open systems, Babylonian, Euclidian, structured pluralism, critical realism, Samuels, Sraffa

JEL codes: B41, B50

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Sheila Dow’s open systems methodology

Among her many accomplishments as a scholar and economist, Sheila Dow has pioneered open systems thinking as a form of methodological argument and as an important foundation for pluralism in economics. She contrasts open systems with closed systems, argues that the history of economics can be explained in terms of how its contributors have reasoned in terms of the former or the latter, and uses this framework to evaluate economics’ development as a specific type of social science explanation. This achievement needs to be appreciated as not only giving added depth to our thinking about economics and the economic world, but also as demonstrating an especially thoughtful understanding of modern society. Under the pressure to specialize in our different domains of life, it becomes less and less common that we acquire the larger understanding of the world that helps us organize and understand the increasing diversity of things that people are able to be and do. Dow’s work stands out as a particularly important counterweight to this and offers us a valuable and positive view of a world open to diversity and human flourishing.

This chapter discusses Dow’s methodological contribution to open systems thinking and pluralism in economics, and how her views developed over the course of her career. The first section reviews the origins of her thinking in connection with her distinction between Cartesian/Euclidian and Babylonian thinking in the history of economics. The second section moves to a further development of her views regarding open and closed systems in her 2002 Economic Methodology book and in her ‘structured pluralism’ conception that emphasizes the role of schools of thought in the history of economics. The third discusses the influential 2005 paper co-authored with Victoria Chick, “The Meaning of Open Systems,” that differentiates their view of open systems from that of Tony Lawson and the critical realists. The fourth section then focuses on an issue that emerges as central to Dow’s and Chick’s view and critique of critical realism, the relationship between models and theorizing and how the latter determines boundaries upon the former. To do so, it discusses how Piero Sraffa used the open-closed distinction earlier in the 1930s to provide a similar understanding of such boundaries and the relationship between models and theorizing. A fifth section briefly summarizes and comments on Dow’s contribution to open-closed systems thinking and pluralism in economics.
1 The foundations of Dow’s distinction between open and closed systems

As a macroeconomist, monetary theorist, and historian of economics, Dow originally set out her distinction between open and closed thinking in economics as a distinction between Cartesian/Euclidean mode of thought and a Babylonian model of thought in her book on methodological thinking in the history of macroeconomics – a book later re-published in a revised expanded edition with added discussions of her subsequent thinking about economic methodology (Dow 1985; 1996). In 1985 when the book first appeared, economic methodology was only beginning to be seriously investigated by historians of economics, and Dow’s book did much to change this. By the early 1990s, however, economic methodology had become an important field within the history of economics (later to become an independent one altogether). At the same time, under the influence of different heterodox economics approaches there were also the beginnings of debates about the nature of pluralism and its role in economics. Especially important as a turning point in this latter regard was a conference on pluralism and economic methodology in Bergamo, Italy in 1994, later published as Pluralism in Economics: New Perspectives in History and Methodology (Salanti and Screpanti, 1997). Dow made an important contribution to the conference in advancing an argument for methodological pluralism, one specifically grounded in an open systems epistemology and ontology (Dow, 1997).² In part, her argument reflected a broad change in thinking among economic methodologists at the time away from a prescriptive, theory appraisal approach to economic methodology, as associated with the thinking of Karl Popper, Imre Lakatos, and Thomas Kuhn, toward a more descriptive approach to methodology that focused on the range of different forms of methodological reasoning in economics. However, by this point Dow also had come to believe that the contrast she had made in her 1985 book between Cartesian/Euclidean and Babylonian modes of thought had been misunderstood, and thus she determined to re-issue the book in revised form to remedy this.

² Warren Samuels also made an important but different argument for methodological pluralism at the conference based on his ‘matrix approach to meaningfulness’ (Samuels, 1997; also cf. Samuels, 1998, and on Samuels’ methodological pluralism, Davis, 2012a).
The 1985 book contrasted the Cartesian/Euclidean mode of thought, framed dualistically in terms of dichotomous categories, particularly as associated with neoclassical economics, with a nondualist Babylonian mode of thought, particularly as associated with Keynesian and classical economics as the means of distinguishing between closed and open types of methodological reasoning. On the one hand, this could be misinterpreted to mean that a Babylonian mode of thought was simply an alternative to the Cartesian/Euclidean mode of thought lacking its own independent form of thinking. On the other hand, the Babylonian mode was at risk of being seen as synonymous with the idea that ‘anything goes’ – a common criticism at the time of arguments associated with calls for pluralism in economics. In Dow’s 1996 revised and expanded edition of her 1985 book, then, she added an entirely new chapter, “Modes of Thought in Economics,” to the original book to clear up such misconceptions. Babylonian thought was not inspired by rejection of Cartesian/Euclidean thought, but is rather constituted in itself a holistic type of thought that emphasizes uncertainty and a pragmatic ‘knowing how’ type knowledge. Indeed Babylonian thought had its own long history not only in the philosophy of science but also in philosophy of economics. Dow in fact took the term from J. M. Keynes, who had used it in his biography of Newton (Keynes, 1933). Keynes, then, was intent on placing Newton in a long history of thinking in philosophy of science that dated from the ancients, but wanted to bring the term into more modern usage.

As Dow later pointed out (2012), the term ‘Babylonian’ as Keynes understood it was largely forgotten until Mark Stohs recalled Keynes’s use of it in connection with a discussion of the latter’s concept of uncertainty. As Stohs put it, on this conception “there is no single logical chain from axioms to theorems; but there are several parallel, intertwined, and mutually reinforcing sets of chains, such that no particular axiom is logically basic” (Stohs, 1983: 87). Essentially in a world of uncertainty we cannot reason from some single set of axioms to all possible consequences, because in an uncertain world there are no required starting points to our thinking. Rather we must always reason in terms of multiple possibilities and indeed in terms of possibilities which may

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3 Dow has given special credit to Brian Loasby for this emphasis on ‘knowing how’ as central to economic reasoning.

4 Keynes asserted of Newton: “[h]e was the last of the magicians, the last of the Babylonians and Sumerians, the last great mind which looked out on the visible and intellectual world with the same eyes as those who began to build our intellectual inheritance rather less than 10,000 years ago” (Keynes, 1972: 364).
conflict with one another. Uncertainty, Dow wished to emphasize, was central to a Babylonian mode of thought, and moreover had a key expression in Keynes’s thinking itself. As a Post Keynesian, Dow thus saw the Keynes connection as central to advancing a type of methodological thinking alternative to the Cartesian/Euclidian mode of thought, one that reinforced the deep differences between mainstream and heterodox economics, and one to which we return to below.

Further, the Keynes connection undercut another criticism of open systems thinking and pluralism associated with the ‘anything goes’ idea. That notion is a pure expression of relativism, and its expression suggested a basis for favoring the Cartesian/Euclidian mode of thought. One always had to assume some things, so the argument would go, in order to explain anything. However, far from avoiding all assumptions whatsoever, Keynes made many important claims (such as concerned the nature of income determination, households’ propensity to consume, liquidity preference, etc.), but had also organized these ideas around his uncertainty idea. Thus, it was not a matter of making no theoretical commitments at all – ‘anything goes.’ It was a matter of an open systems type of reasoning that one employed in regard to how one organized one’s theoretical commitments.

The Babylonian mode of thought accordingly required a more sophisticated kind of thinking than is involved in simply following out the deductions that a set of assumptions allowed as if explanations of the world itself worked in the neat manner of logic. One always needed to examine complex arrays of potentially conflicting possibilities the world constantly threw up, and the only way this could be done is by following out these competing paths the economy might follow, evaluating their likelihood relative to one another in terms of the circumstances at hand. The Babylonian mode of thinking, therefore, is not the dual of the Cartesian/Euclidian mode of thought as an ‘anything goes’ idea, but is rather based on an entirely different epistemology and ontology. In the simplest language, as Dow saw, it sees the world and knowledge as open, not closed, and builds one’s reasoning around this.

For Dow, of course, Keynes’s concept of uncertainty is fundamental to economics and distinctive of Post-Keynesian economics. Accordingly, putting this in the language of economic analysis, she would hardly say that Keynes and Post-Keynesianism treat all variables as endogenous. Rather, what variables are endogenous and what variables are exogenous depends on the purposes of the
analysis being undertaken. This is all the more the case in economic environments that are evolving and rapidly changing. Thus, these clarifications of her original views not only answered critics of open systems and pluralism, but also prepared her to further deepen her thinking about open systems. Dow went on do this in her well-known *Economic Methodology* book and with her 2003 International Network for Economic Method Distinguished Lecture in which advanced a ‘Structured Pluralism’ view of the role of schools of thought in the history of economics.

### 2 Economic Methodology and ‘Structured Pluralism’

In 2002, Dow published *Economic Methodology: An Inquiry* which became as a leading textbook in economic methodology.\(^5\) One thing distinctive about the book as a text is that unlike most economics textbooks it does not present economics as having followed a single path of development with only one correct understanding of its history. Economics’ history is instead shown to exhibit many different sorts of explanations and arguments which cannot all be reduced to a single narrative. Methodologically speaking, then, we cannot dismiss some approaches out of hand for having made some sort of fundamental mistake, nor disregard some ideas because they seem to have marked out pathways of thinking alternative to dominant or more influential views. Different sorts of explanations are seen as having been motivated by different interpretations of historical problems and thereby serve different explanatory functions. Dow consequently rejects the naïve historiographical view that history is transparent and determinate because it is past, and rather recognizes that our understanding of history, and also the history of economics itself, continually evolves as we investigate it in the present.

This sensibility, moreover, is clearly grounded in her open systems thinking. History never follows the proverbial ‘royal road’ because there are always competing concerns and possibilities regarding how things may play out. Accordingly, different types of explanations may well be self-contained or closed to one another, but all nonetheless occupy the same complex world, and so

\(^5\) Beginning in 2002 I taught this book for a number of years at the University of Amsterdam in an introductory course in economic methodology.
taken together make up a history that is open. Dow is clear about what this means for understanding economic methodology at the outset of the book.

The fact is that methodology is not the finger-wagging exercise which many mistake it for. While over twenty years ago there was more emphasis on interpreting rules for good science, to apply them in economics, now there is much more engagement with economics itself. Much of modern methodology in fact simply aims to build up a methodological account of what economists do (Dow, 2002, vii).

And indeed, economists do many different sorts of things, reflecting the range and diversity of insights and assumptions we find historically in economic reasoning.6

How, then, should a text on economic methodology text be organized? A ‘royal road’ model would proceed chronologically, setting out a succession of historical accomplishments which are added up show how one ought to reason at any point in time about the nature of explanation in economics, and which over time have produced an ever-improving knowledge of the economy.7 Along the way, mistaken views are always set aside, so that the history of economics and our understanding of what good explanations in economics involve seamlessly advances. This ‘progress’ view of science, of course, is a popular one. Yet professional historians, including historians of economics, generally recognize that history exhibits a more irregular development, that what was thought important sometimes turns out not to have been important and what was thought unimportant sometimes turns out to have been important, such that different paths of development often complete with one another over extended periods of time and there is no single history. In short, thinking about what we learn from the past is a complicated matter that requires an open mind and a willingness to question established ideas. Indeed, the idea that history records ‘progress’ over time can be contested as well.

6 Moreover, economists also do funny things, as Dow shows in opening the book with ‘insider’ jokes about economists (2002, 1-3). This may seem to some a frivolous way to begin, but the jokes she presents function as ironic comments on economists’ methodological thinking. In my experience teaching the book, they succeed in stimulating students to think critically about the arguments they will review in the book, and not just take them as a given ‘truth’ – precisely an open systems approach to learning.

7 The ‘royal road’ model is often referred to as the ‘Whig’ interpretation of history. A notable critic of this interpretation was Mark Blaug (Blaug, 1990). I discuss the development of his thinking and critiques of mainstream economics historiography in Davis (2013).
Dow indeed captures this thinking in the way her *Economic Methodology* – appropriately subtitled an *An Inquiry* – is organized. It begins with a chapter discussion of the state of economics including how it may be perceived by the public: “Where is Economics going?” Given that there are no definitive answers to this question, this chapter is followed by two that also appropriately signal the open-endedness of economics: “Some Theoretical Issues” and “Some Empirical Issues” (note they are also only ‘some’ issues). The book then goes on with two chapters that inquire about the nature of economics: “The Scope and Purpose of Economics” and “Progress in Economics.” These are followed by chapters which emphasize epistemological and ontological types of methodological concerns economics addresses: “Understanding Economics” and “Understanding the Economy.” The closing chapter returns to and reinforces the issues theme: “Issues for Methodology and Economics.”

Thus, *Economic Methodology* is not only an *Inquiry* investigating the nature of explanation in the history of economics, but also, in rejecting conventional pedagogical approaches, organizes students’ learning itself as an *Inquiry*. Perhaps Dow would comment, ‘how else can students investigate the history of economics?’

In contrast, Dow’s “Structured Pluralism” paper, presented as the Distinguished Lecture at the 2003 International Network of Economic Method (INEM) conference at the University of Leeds, speaks to knowledgeable historians and methodologists of economics. Here she begins by picking up the thread from the Bergamo pluralism conference, asserting that “people interested in economic methodology seem to be, in a broad sense, ready to endorse one kind or another of ‘pluralism’” (2004, 275). At the same time, she finds it “curious” that this seems to have been accompanied by a “growing reluctance to refer to schools of thought in economics” since in her view this would seem to have been “one of the most obvious modes of pluralism within economics since the 1960s” (Ibid.).

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8 She also cites as a supporting voice for pluralism in economics, Wade Hands’ then recently published, comprehensive survey of ‘new economic methodology’ (Hands, 2001).

9 One important manifestation of this development, she notes, was the emergence of a grouping of some 40 international organizations under the label the International Confederation of Associations for Pluralism in Economics (ICAPE).
category, where the primary foundation for pluralism (for example, for critical realists, she adds) has simply become the open-closed distinction. Dow finds this paradoxical. That different schools of thought exist and co-exist would seem to be an important aspect of pluralism. Thus, she took the occasion of her Lecture to ask “whether there is a continuing role for categorisation according to schools of thought in economics within methodological pluralism” (Ibid., 276).

Her argument regarding schools of thought is historical – they are a relatively recent phenomenon resulting from increasing differentiation, or fragmentation, of ideas within both orthodox and heterodox economics since the 1960s. Describing this in terms of the paradigm thinking of Thomas Kuhn (1970), she associates this development with the notion that different approaches or schools are incommensurable with one another in the sense that communication between them is difficult if possible at all. In effect, different paradigms, or schools of thought, employ different languages that are not easily translated into one another. This, however, could have unfortunate implications for methodological pluralism, since if schools are relatively isolated from one another and thus reluctant to communicate, rather than a positive state of affairs methodological pluralism might then be understood as authorizing an anarchic ‘anything goes’ in multiple arenas. For Dow, this calls for serious reflection upon what pluralism is and what it entails.

To begin, then, she believes it is helpful to distinguish, following Salanti (1997), between pluralism as an ethical principle and pluralism as an epistemological principle.\(^\text{10}\) This is helpful but also creates a tension. The ethical grounds for pluralism – whether a diversity of approaches should be recommended – tend to enjoy general support as a sort of live-and-let-live principle of tolerance, while the epistemological grounds – that there are different types of explanations in economics – are in often dispute since one manifestation of there being different schools of thought is that their proponents are often inclined to believe that they alone have the correct epistemological approach. This stance would not only be at odds with a pluralist vision of economics but could also put ethical pluralism at risk. Thus, we have a dilemma between what pluralism can reasonably be taken to involve and that schools of thought have become increasingly characteristic of a more fragmented, post-1960s economics. What, then, is Dow’s response?

\(^\text{10}\) This is a distinction, Dow notes, that Warren Samuels also makes (Samuels, 1997, 1998).
In the first place, she adopts a more moderate Kuhnian sort of view in holding that communication between schools is possible despite the difficulty involved. That is, she modifies Kuhn’s incommensurability principle. Second, she rejects the idea that within schools of thought ‘anything goes.’ Indeed, different approaches in economics still share concepts and forms of reasoning that constrain economists’ arguments, so it is obviously not the case that ‘anything goes.’ Third, she agrees with Warren Samuels (1998) that even if we cannot produce epistemological ‘metacriteria’ to adjudicate between different schools’ epistemologies, the existence of different schools of thought points to the boundaries between them where reasoned debates about differences are possible. That is, the boundaries between different schools of thought identify where communication is possible – a communication which combines agreement regarding where differences between schools of thought lie and disagreement regarding their justifications. Dow, then, had previously characterized her view as a ‘modified pluralism’ (Dow, 1997) or as a ‘moderate pluralism’ (Dow, 2002). Here she replaces these terms with the term ‘structured pluralism’ to capture the idea of an economics open to different approaches with communication between different schools at those points they identify as determining their differences from one another.

This, consequently, creates an agenda for investigating the status and nature of pluralism in economics associated with how schools manage the boundaries between themselves and other schools. As with the boundaries between countries, there are different strategies and behaviors one can adopt towards one neighbors. Evaluating these different strategies and behaviors then becomes central to how we assess the status and nature of pluralism in economics. Thus, should schools of thought (like countries) adopt a relatively intolerant posture towards one another reflected in an unwillingness to communicate regarding the boundaries between them, then we ought to characterize those schools as relatively closed, and should this be true of most schools of thought, then economics altogether ought to be characterized as relatively closed. Alternatively, should schools of thought (like countries) adopt a relatively tolerant posture towards one another reflected in a willingness to communicate regarding the boundaries between them, then we ought to characterize those schools as relatively open, and economics altogether ought to be characterized as relatively open. In this way, the open-closed distinction takes on new duty. It is not the sole means of understanding pluralism in economics, with schools of thought reduced to
secondary category status. Rather, the open-closed distinction and schools of thought are understood in terms of each other, and therefore as together providing the basis on which economics can be, or fail to be, methodologically pluralist.

Dow thus goes on to lay out two parallel lists of six points each pertaining to the characteristics of schools of thought that influence whether they are and economics is closed or open.\textsuperscript{11} I reproduce these two lists of characteristics in Table 1.

\begin{table}[h]
\centering
\caption{Characteristics of open and closed schools of thought}
\begin{tabular}{l}
\textit{Closed systems characteristics} \\
1. All variables can be identified in a system. \\
2. The boundaries of a system can be specified and whether variables are exogenous or endogenous can be determined. \\
3. Only exogenous variables affect the system. \\
4. Relations between variables are known or random. \\
5. The components\textsuperscript{12} of the system are independent and atomistic. \\
6. The structure of relationships between a system’s components is known. \\
\textit{Open systems characteristics} \\
1. It may not be possible to identify all variables in a system. \\
2. The boundaries are semi-permeable (and the classification of variables may not be fixed). \\
3. There may be omitted variables whose effects on the system are uncertain. \\
4. There is imperfect knowledge regarding relations between variables. \\
5. Interrelationships between agents exist and may change.
\end{tabular}
\end{table}

\textsuperscript{11} These six points are also set out in Dow (2002, 139-140) and paraphrased in Chick (2004).

\textsuperscript{12} Components refers to types of agents, such as individuals and firms.
6. This structure may be imperfectly known and/or may change (structure and agency are interdependent).

Methodological pluralism, then, involves embracing the latter, open systems side of these six points. In effect, proponents of different schools of thought recognize from their interaction with other schools that their own school’s commitments and assumptions are always subject to re-evaluation. They need not abandon those commitments and assumptions, but need to see them as programs of investigation always subject to change and modification. This posture describes an economics structured around schools in a pluralist way – a structured pluralism.

As a final comment, it is important to see the influence Keynes has had on Dow’s thinking. As she puts it: “Keynes’s epistemology developed on the basis of an ontology of open social systems with all the characteristics outlined above” (Dow, 2004, 284). Thus, though Keynes did not use the language of pluralism or open systems in the ways these ideas have developed in the post-war period, for Dow he was an important forerunner of these ideas, especially in the key role his concept of uncertainty plays in his economics. In effect, how Keynes combined epistemology and ontology made his economic analysis open to history and communication with other schools of thought. He did not, in Dow’s view, prioritize ontology and economics’ ontological commitments over its epistemological reasoning. This, however, is exactly what she charges critical realists have done in making ontological commitments the primary determinant of whether an economic approach or school of thought is open or closed. “It is this binary classification (open/closed) of ontology which is most significant for critical realism” (Dow, 2004, 285). Accordingly, I turn to Dow’s (and Chick’s) evaluation of critical realism and open systems in the follow section.

3 Chick and Dow on open systems and critical realism

“The Meaning of Open Systems” (Chick and Dow, 2005) was presented at the 2004 International Network for Economic Method meetings at the University of Amsterdam, and built upon and

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13 That is, Dow’s second list for an open systems economics.
further developed both authors’ previous thinking about open systems. They began by noting that because the terminology of openness and closure had been used in a variety of ways, it is important to begin by stating how it applied to systems. A system, then, is “an organized or connected group of objects” or a “set of correlated principles, ideas, or statements belong to some department of knowledge or belief” (364). On both levels, whether referring to objects and/or ideas, systems (a) vary in degree of completeness (the extent to which things within them are connected), (b) mutability, and (c) in their relations with what lies outside of them as systems (366). An open system, consequently, is one in which certain specific conditions hold, on the one hand, as “applies to characteristics of perceived reality” and, on the other hand, as applies to “theories about reality” (Ibid.). I have reproduced these two sets of conditions in slightly simplified form in Table 2 below.

Table 2: Conditions for open systems

<table>
<thead>
<tr>
<th>Real world systems</th>
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<tbody>
<tr>
<td>i. The system is not atomistic (outcomes cannot be inferred from actions or agent interactions may change)</td>
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<tr>
<td>ii. Structure and agency are interdependent.</td>
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<tr>
<td>iii. Boundaries around and within the system may change (structures may evolve, connections between structures may change, structure-agent relations may change).</td>
</tr>
<tr>
<td>iv. Particular social structures are embedded in larger structures and boundaries are generally permeable.</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Implications for theoretical systems</th>
</tr>
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<tbody>
<tr>
<td>i. There may be important omitted variables and/or their effects on the system may be uncertain.</td>
</tr>
<tr>
<td>ii. The exogenous-endogenous classification of variables may be neither fixed nor exhaustive.</td>
</tr>
<tr>
<td>iii. Connections and/or boundaries between structures may be imperfectly known and may change.</td>
</tr>
</tbody>
</table>
iv. There is imperfect knowledge of the relations between variables and relationships between them may not be stable.

Closed systems, then, exist where all these conditions fail. In contrast, there are degrees of openness in open systems, whereby some but not all these conditions may hold, such that open systems can be said to fall on a spectrum of openness depending how many of them hold (Mearman, 2005).\(^\text{14}\)

A further, important complication, Chick and Dow emphasize, is that subsystems may exist within systems, and relatively closed subsystems may exist within otherwise open systems. Following Keynes’s point that one sometimes keeps the features of a system that contains a subsystem “at the back of one’s head” (Keynes, 1936, 297-8), in focusing on a given subsystem one may provisionally ignore aspects of reality associated with the larger system that contains it – a method known as abstraction. This practice breaks down if the (sub)system in question is taken to be complete in itself and lacking wider effects potentially acting upon it – a method known as idealization. For example, New Classical Economics is closed in this sense in that though it incorporates expectations, no room is left for such things as exogenous shifts in expectations. Thus, the larger system Keynes would argue is kept “at the back of one’s head” that contains the New Classical subsystem is ignored. The model is simply closed.

For Chick and Dow, then, Keynes’s case exists where subsystems’ boundaries are effectively permeable, thereby allowing a range of investigations regarding how different aspects of the system influence a subsystem’s performance. A useful way to think of this is to associate subsystems with models and systems with theories. Theories, then, can be open and models can be provisionally closed. This understanding is important to Chick and Dow’s view of critical realism’s treatment of the open and closed distinction.

\(^{14}\) Though complete openness is incompatible with a ‘system’ being recognized as a system.
Critical realism, especially as developed by Tony Lawson, identifies closed systems by their reliance on event regularities and open systems by their absence (Lawson, 1997, 2003). Reality, he argues, corresponds to the latter circumstance. The world is open in the sense that event regularities rarely obtain. It follows that since economic models describe relationships between variables that are seen to be regular and repeated, models assume event regularities, and therefore are per se closed. That is, once formulated, their boundaries cannot be permeable in the Keynes sense above. Indeed for Lawson, this is reflected in the fact that in economics models are typically formalized and given mathematical representation. The use of mathematics in economics itself is accordingly seen as involving a commitment to closed systems thinking in the sense that the determinacy mathematical representation involves implies an event regularity view of the world.

Clearly then, Chick and Dow’s analysis is quite different since they allow that subsystems formulated as models can be seen as only provisionally closed when they are contained in larger systems, or theories, taken to be open. What they require for this is that those subsystems’ boundaries are permeable, meaning that they can be interpreted in such a way as to allow different aspects of the system containing them to influence their performance. Lawson denies subsystem boundaries are permeable when they possess an event regularity character. Chick and Dow agree that if a model/subsystem is fully closed in the idealization sense, then the relevant boundaries are impermeable and this is incompatible with an open systems thinking. But they do not see event regularities as implying this. Indeed, an event regularity can be consistent with open theoretical systems as they understand them. Their example is Keynes’s income-consumption relationship, where numerous features affecting that relationship are held in the background. Accordingly, they allow that economic models can be formalized and mathematical, even if this means they represent event regularities, and still associated with an open systems thinking.

The difference between them, then, comes down to the how event regularities are understood. Dow and Chick are clear about this. For Lawson, they note, the open and closed distinction is entirely an ontological matter: “Lawson gives priority to ontology” (Chick and Dow, 2005, 370). In contrast, on their view the issue is a matter of “the relationship between theorizing and reality” (Ibid.) – as reflected in their two lists in Table 2. They give considerable attention to this relationship in the third section of their paper, but without going into this discussion in detail we
can say the issue for them is what a theory’s structure implies about the relationships one models, including in event regularity form. In their view, focusing on event regularities *per se* tells us nothing about “the relationship between theorizing and reality” or whether an open theory structure is associated with event regularities or not. In effect, there is no simple connection between event regularities and the conditions for open systems. The latter, then, should be our focus, not event regularities, when we ask whether open systems theorizing applies in any given case.

The third section of their paper, then, focuses on the nature of the boundaries theories adopt in the models they advance. For Chick and Dow, boundaries are “in general semi-permeable and mutable” (373), and how theorizing proceeds in economics involves a wide range of choices regarding treatment of boundaries. Thus, mainstream economics treats boundaries as hard and impermeable. Critical realism essentially rejects the boundaries concept on the grounds that all reality is said to be open so that boundaries must create ‘distortions’ in the representation of reality. Theory should thus always be constructed as an ontologically open. Chick and Dow, in contrast, differentiate schools of thought according to how they conceptualize the boundaries of models in their theories. Models are embedded in theoretical systems, but how this occurs varies according to the economist’s commitment to openness. In the case of mainstream economics, if a theory is defined in terms of its models, that theory is closed. Many economists, however, are less narrow, employ an open system framework, and differ in regard to how they set boundaries on their models. This explains, then, why there are different schools of thought in economics. It also demonstrates a key foundation for pluralism in economics. Pluralism, that is, has its basis in how economists differ in their understanding of “the relationship between theorizing and reality.” This presupposes that reality is open (as Lawson argues), but also that its modeling gets provisionally closed according to the economist’s understanding of that reality. I turn, then, in the final section of this paper to the issue of how boundaries can be understood in connection with related ideas Sraffà developed on this subject.

4 Sraffà on open and closed systems
Sraffa is known for his famous *Production of Commodities by Means of Commodities* (Sraffa, 1960), but the thinking that led to that book began much earlier in the 1920s and 1930s. One important text that illustrates this, which in his view constituted an important turning point in his development of his later thinking, is his 1931 unpublished “Surplus Product” (Sraffa, 1931). There Sraffa refers to a problem that his method for determining commodity values produced when incorporating his key concept of surplus product. I have discussed this manuscript elsewhere in some detail (Davis, 2012b, 2018, 2021), and here focus on how Sraffa used the open-closed distinction to argue that the boundary between production and distribution is essentially open and closed at the same time. This view, I suggest, is an early contribution to the same thinking about open and closed systems in regard to models and theories laid out in the last section and thus a further basis for pluralist thinking in economics.

The problem Sraffa thought his approach encountered was as follows. He believed that a commodity’s value is determined by the commodities used up in its production – a classical cost of production approach. In an economy that produced a surplus, however, the value of the surplus was determined by both the commodities that made it up, which capitalists consumed, and also according their willingness to withdraw circulating capital from production in order to engage in luxury consumption. The idea that a commodity’s value is determined in a cost of production way involves a natural science, objectivist (or physicalist) sort of explanation Sraffa favored (Davis, 2012b), but the willingness idea instead involves a subjectivist sort of explanation. This was a problem for Sraffa’s intended rehabilitation of classical political economy which he sought to build around a theory of commodity value alternative to the neoclassical subjectivist theory of prices.

How, then, Sraffa resolved this dilemma was to adopt an open-closed analysis of the relationship between the system of commodity values and how distribution acted on that system. Explicitly using open-closed language, he maintained that commodity production constituted an ‘closed system’ that was acted upon by causes external to that ‘closed system’ associated with the distribution of the surplus. Referring to that ‘closed system’ as the ‘economic field’ he concluded that
There must be a leak at one end or the other: the ‘closed system’ is in communication with the world.

Here, ‘the world’ refers to distribution, which reflected the historical and social conflict over the shares of wages and profits in national income. He then added:

When we have defined our ‘economic field’, there are still outside causes which operate in it; and its effects go beyond the boundary (D3/12/7: 161 (3-5); quoted in Kurz and Salvadori, 2008, p. 268).

What I suggest is especially relevant to the discussion of boundaries and open and closed thinking in the last section, then, is how Sraffa describes this “communication” in terms of the way “outside causes” associated with distribution “operate in” the ‘economic field’ and produce “effects that go beyond the boundary” created by ‘the economic field’ (my emphases). This two-way movement across this boundary both modifies commodity values from what would be the case were there no surplus (the subsistence economy) and enter into determining the respective values of wages and profits. This implies that the ‘economic field’ is both relatively closed – because commodity values are still determined primarily in cost of production terms – and yet at the same time open to what lies “outside” it – since the distribution of the surplus influences commodity values. This is also captured metaphorically by Sraffa’s idea that there is somehow a “leak” in the ‘closed system’ determining commodity values.

Thus, Sraffa adopts open-closed thinking and also makes the boundaries between his ‘closed system’ (the ‘economic field’) and what lies outside it (distribution) permeable. He can be seen as having done this, because he sees (i) the ‘economic field’ operating like a system subject to his cost of production model of that system, and (ii) distribution as being determined by a range of historical and social factors that permit different theories of how the shares of wages and profits are produced. That is, Sraffa’s use of the open-closed distinction parallels that presented in the last section as formulated by Chick and Dow in terms of models and theories, and thus constitutes an earlier understanding of the role of the method of abstraction in view of the relationship between models and theories. His later *Production of Commodities by Means of Commodities*, I believe,
retains this conception, despite the fact that there he does not refer to the open-closed distinction. It seems fair to say, then, that the book is successful in its rehabilitation classical political economy’s cost of production theory of value as an alternative to the neoclassical account, in part because of this methodological strategy. Indeed, the way in which production is both closed and also open to distribution provides a quite different view from how in the neoclassical supply-and-demand, general equilibrium model the distribution of income and commodity prices are jointly determined. There, as reflects the closed modeling approach of mainstream economics, everything is subsumed in the model, models and theories are not differentiated, and the world plays no role in economic life apart from its idealization in the model.

5 Concluding remarks on Dow’s open systems thinking and pluralism in economics

The goal of this paper was to examine Dow’s thinking about the open-closed distinction and its relationship with her commitment to pluralism in economics. As she has repeatedly noted, pluralism has many meanings, an implication of which is that without a clear understanding of what it involves we run the risk of defenses of pluralism being ineffective. Thus, what she has done is seek to ground our understanding of pluralism in a particular methodological framework, namely, one developed in terms of the open-closed distinction. Of course, one might say this only compounds the problem of explaining pluralism because that distinction can be used in multiple ways as well. For Dow this consequently entailed sorting out that distinction in a clear way as well. It should be noted, however, that in this regard she had a key prior intuition about what pluralism in economics involves which guided her toward how she believed an open-closed account of pluralism needed to be developed. That prior intuition was that throughout its history there have existed schools of thought in economics whose differences are central to explaining how economics has developed historically – her ‘structured pluralism’ conception. The hard work, then, was getting from this intuition to an account of what the open-closed distinction involves in economics. The result of years of reflection on pluralism and her important collaboration with Chick was their influential “The Meaning of Open Systems” paper where they systematically worked out how models could be provisionally closed and yet open to competing theories – as
reflected competing schools of thought – based on what, as Keynes put it, one kept “at the back of one’s head” when one worked out any particular determinate analysis.

My argument in the last section that Sraffa worked with a similar methodological conception had two purposes. First, I hoped to begin to make the case that the open-closed analysis that Dow and Chick advance has earlier antecedents in similar methods of reasoning employed in classical political economy. From this perspective, Sraffa’s rehabilitation of classical political economy can be seen as involving both the recovery of a type of economic theory and also a method of reasoning that can be interpreted in open-closed terms. Second, looking forward, my view is that linking our contemporary open-closed thinking to the method of reasoning in classical political economy, because it emphasized how institutional, historical, and social factors determine how economies function, may help motivate the development of an economics in the future that is pluralist and open in its attention to those factors. A modern political economy, it seems, would need to rely upon the same type of reasoning. In any case, my view then, is that Dow has made a significant contribution to both purposes in giving the idea of a pluralist economics durable methodological foundations. Of her many contributions, here she leaves others the opportunity to continue building on these foundations to advance economics’ practice and commitment to pluralism.

References


