

The crisis of identity in modern economics

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Abstract

We read two recent texts on the history of 20th century economics through the work of philosopher Michel Foucault. Our reading proposes that each text operates with a distinct methodology, both of which can nonetheless be associated with a different period of Foucault's research on discourse, institutions and power. We argue that these distinct approaches to the history of economics are complementary. Focusing on two themes covered in these texts, the socialist calculation controversy and the disappearance of the individual/body in modern economics, we attempt to make their complementarities clear. This also allows us to consider the implications these texts have for discussions concerning the uniformity and even identity of contemporary economics. Without downplaying the hegemony – now or in the past - of the orthodoxy, our reading of these texts suggests that unity may exist coextensively with disunity and that at the heart of identity exists difference and crisis.

JEL: B20, B41, B50, D01, D02

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Philip Mirowski, *Machine Dreams: Economics Becomes a Cyborg Science*. Cambridge: Cambridge University Press, 2002, pp. xiv+655.

David F. Ruccio and Jack Amariglio, *Postmodern Moments in Modern Economics*. Princeton and Oxford: Princeton University Press, 2003, pp. xix+349.

0. Introduction

In late 1980s, Jack Amariglio wrote optimistically of a ‘growing [philosophical] self-consciousness’ (1988: 583) among (an admittedly modest subsection of) economists. This emerging philosophical sensibility included not only a sustained interest among economists in the major historians and philosophers of science (Kuhn, Lakatos, Popper, etc.), but also an implicit promise that such philosophical incursions might expand beyond these strictly methodological areas. In the spirit of both aiding and intervening in this possible expansion, Amariglio’s article introduced Michel Foucault’s philosophico-historical work on power and discourse in order to change the way we look at the history of our discipline. Even though they do not come out as explicitly or exclusively Foucauldian, the two texts that we will review in this article do precisely that: they represent two different ways in which elements of Foucault’s work can continue to contribute and influence research in the history of economic discourses. In *Machine Dreams: Economics Becomes a Cyborg Science*, Philip Mirowski offers a *diachronic* account of mainly post-WWII mainstream economics that situates the latter within its institutional as well as (inter-) disciplinary context. This is a methodology of research we find in the emerging fields such as Science and Governmentality Studies and takes its cue from Foucault’s well-read institutional genealogies of the Clinic and the Prison. Ruccio and Amariglio, on the other hand, offer a *synchronic* mapping of the postmodernist ruptures within the overarching modernist *episteme* that informs both orthodox and heterodox traditions of the discipline. Accordingly, their discourse-analytical and deconstructive approach is, in part, shaped by Foucault’s archeological analyses of the epistemic conditions of possibility of particular discourses.

Nonetheless, taking Foucault’s invitation to study the institutional as well as the epistemic

contexts of knowledge production and dissemination seriously is not the only shared feature of these two texts. They also share a common hypothesis about the state of our discipline: In their own ways, both texts argue that modern economics suffers from at least two different, yet intimately related, crises of identity. The first crisis is a one that pertains to the identity of economics as a unified discipline. In *Machine Dreams*, Mirowski argues that the heterogeneity of approaches that emerged in the last quarter of the last century were an unintended consequence of the mainstream's attempt to respond to the demands of the Military-Industry-Research Complex and to defend its 'identity' against the invasion of the cyborg sciences. In their *Postmodern Moments in Modern Economics*, Ruccio and Amariglio, represent economics as a discipline that continually transforms itself in its attempts to domesticate the 'disruptive' and 'threatening' force of what they identify as postmodern moments (e.g., uncertainty, decentred body, disorder, disequilibrium, and so on). In both cases, we find an image of modern, or more precisely, *modernist* economics that perpetually struggles to contain the deconstructive effects of its identity crisis.

This shared diagnosis of a crisis of identity at the disciplinary level, however, is not the only crisis that these books encircle. Both texts insist that there is another crisis of identity that troubles modern economics. In this second case, the identity that suffers from crisis is the identity of the economic agent. Both *Machine Dreams* and *Postmodern Moments in Modern Economics* identify a growing difficulty of orthodox economics to convincingly represent the individual as a rational and unified subject. Ruccio and Amariglio insist that there is nothing in the Arrow-Debreu model that makes rationality an intrinsic attribute of the mind of the human individual and offer a novel reading of the model where rationality inheres in the very procedures of optimization. Mirowski goes even further and challenges the contemporary proponents of experimental economics to come to terms with the radical implications of their findings (i.e., 'institutions matter') and outlines a formal institutional economics where various market types (e.g., posted-offer, double auction, clearinghouse) are conceptualized as an heterogeneous set of algorithms, or institutional devices, that function as extensions of human body.

In this review essay, we will attend in some detail to these three matters. The next section, titled ‘Foucauldian themes’, elucidates what we mean by *the genealogy of the institutions of power/knowledge* (the method of reading used by Mirowski) and *the archeology of epistemic conditions of a discursive field* (the method of reading used by Ruccio and Amariglio). In a sense, this is a section that excavates not only the Foucauldian methods deployed in these texts but also the themes that these authors have inherited from Foucault. The following two sections, using two concrete examples discussed in both books, illustrate some of the ways in which these two methods of reading the history of economics may supplement one another. Because such epistemic and institutional studies contribute to the ‘growing self-consciousness’ of economists about their ‘philosophical habits’ (Amariglio, 1988: 583), we believe that they are relevant not only for the historians and methodologists of economics but also for those economists who simply take institutions *seriously*.

1. Foucauldian themes

Even though these two texts ‘read’ economics in different ways, they share a common interest in a number of Foucauldian themes. First, given the accent that they place on the *conditions of existence* of economics, both books part their ways with the internalist histories of economics. Second, both texts foreground and explore how discursive unity and dispersion, regularity and irregularity, continuities and gaps structure economics. And third, both texts devote particular attention to the status of the subject or Man (sic) within theory. In this section, we will discuss how each book further explores these three characteristically Foucauldian themes.

Epistemes and institutions in the history of economics

Internalist histories of economics assume that ‘all ideas are merely reactions to previous developments internal to the discipline under consideration’ (Mirowski, 1988: 12). In contrast, an externalist narrative gives strong explanatory power to the broader social and theoretical contexts of an idea’s production and acceptance. Both Ruccio and Amariglio and Mirowski operate in an externalist fashion. Yet, there are significant differences in their

respective externalisms. In our reading, the differences in their approaches roughly map onto two currents of thought/method within Foucault's writings. We find the work of Herbert Dreyfus and Paul Rabinow (1983) most useful in this context. According to their presentation, it is possible to find two distinct methods of research in Foucault. While some of his earlier texts, such as *The Archaeology of Knowledge* (1972) or *The Order of Things* (1973b), propose to excavate, like an archeologist, the epistemic conditions of existence of particular discourses, his later studies offer careful genealogies of institutions of power/knowledge such as the Clinic and the Prison. (The relevant texts are, respectively, *The Birth of the Clinic* (1973a) and *Discipline and Punish* (1979).)

According to Dreyfus and Rabinow, the first Foucault 'sought to make the history of the human sciences intelligible in terms of rules which, unknown to the actors involved, regulated and governed all their serious speech acts' (1983: 102). This is the Foucauldian project we find elements of in Ruccio and Amariglio. Such an approach is certainly not internalist because the epistemic conditions of existence that regulate and make possible different economic discourses exist beyond the narrow scope of economics or the actors involved in immediately producing economic theory. In our reading, the key to understanding Ruccio and Amariglio's methodological alternative to internalism is in their first chapter, 'An Introduction to Postmodernism, for Economics', which also happens to be an enormously useful presentation of postmodernism for both economics and even the more philosophically-inclined disciplines.¹

Eschewing the use of postmodernism to refer to a stage in a historical meta-narrative,

¹ We may use this occasion to note that, while Foucault is a very influential figure in *Postmodern Moments*, he is by no means the only one. Friedrich Nietzsche's critique of metaphysics, Louis Althusser's critique of theoretical humanism and the Althusserian concept of 'symptomatic reading', Gilles Deleuze and his philosophy of difference, Jacques Derrida's deconstruction, and finally Richard Rorty's pragmatism are also among the constitutive influences of this more philosophical of the two texts under review.

Ruccio and Amariglio are interested in postmodernism as a ‘condition’ related to ‘changes in discourse itself, especially those that concern knowledge, technology, and science, and thus economics’ (Ruccio and Amariglio, 2003: 10). This discursive postmodern condition is one that embraces notions of indeterminacy, chaos, instability, fragmentation, multiplicity, and so on. It is this discursive notion of the postmodern that Ruccio and Amariglio use as an entry point into the history of economics. As such, their text is an attempt to produce a knowledge of the status of economics within the current episteme. Foucault defines *episteme* as the totality of the ‘set of relations that unite, at a given period, the discursive practices that give rise to epistemological figures, sciences, and possibly formalized systems’ (Foucault, 1972: 191). Such an approach is not particularly concerned to trace the history of a concept or theory in all its historical-empirical complexity. Instead, it is an archaeological exposition of the contemporary *modernist* episteme— with all of its unevenness, displacements, contradictions and postmodern moments— that the wide range of legitimate and ‘illegitimate’ economic discourses inhabit.

According to Dreyfus and Rabinow, the second Foucault ‘now finds the human sciences intelligible as part of a larger set of organized and organizing practices’ (1983: 103). While the former Foucault is thoroughly oriented on discourse as an object of analysis, we now see a shift towards institutions as ‘organized and organizing’ practices that are mutually constitutive with respect to power and knowledge. As such, in this period, Foucault’s method becomes less discourse analytical and more historical-institutional.

It is in this historical-institutional dimension, one in which the cyborg sciences are not only a discursive condition, but also a set of ‘organized practices’ that Mirowski opens his text: ‘The first thing you will notice is the light’ (2002: 1).² Beginning with the glow of the computer

² A ‘cyborg’, or ‘cybernetic organism’, is an organism composed of both organic and mechanical parts. While ‘cyborg’ frequently refers to individual human organisms aided by mechanical parts, a ‘cybernetic organism’ more generally refers to organic-mechanic networks of command, control,

screen, we proceed to the ‘closed rooms’ of the cyborg sciences—the ‘electronic and control centers that were the nexus of the spread of computer technologies and computer culture’ (2002: 2). Tellingly, this architectural-institutional introduction to the cyborg is where Mirowski makes one of his two references to Foucault. It is not only a general predisposition to a Science Studies approach that accounts for the rich institutional detail of *Machine Dreams*. According to Mirowski, even if the image of science as a self-contained marketplace of ideas populated by atomistic truth-seekers had some merit before the Twentieth Century, it has been rendered totally obsolete by the revolutionary transformations in the funding and organization of science that thoroughly embeds research within corporate and governmental infrastructure. Economics is no exception to this and Mirowski argues that the development of modern mainstream economics cannot be understood outside of institutions like the Cowles Commission, the Rand Corporation and the development of Operations Research during and after the WWII.

To recapitulate, these two texts offer us two distinct methods of reading the history of economics. In other words, both texts, self-consciously steering away from the linear/incrementalist narratives produced by mainstream historians of economics offer innovative yet distinct ways of doing externalist history of economics. Their externalist approach to economics enables the reader to understand economics as a discipline where many different economic discourses struggle with one another for hegemony, as a discursive field whose boundaries are constituted, shaped, or even policed by means of concrete

communication and information. The classic example is the command and control of anti-aircraft artillery comprising relationships between humans, aircrafts, anti-aircraft guns as well as all other mediating mechanical elements (see Wiener, 1961). This classic military example is also illustrative of the fact that the ‘cyborg sciences’ often refer to precisely those sciences focused on the interdisciplinary problems of command, control, communication and information that grew out of the close relationship between scientific research and the military during and after World War II (Haraway, 2000).

institutions.

Unity and dispersion in the discipline of economics

It is common for those located somewhere outside of the mainstream of economics to question trends of homogenization or diversification in the orthodoxy. Such discussions often operate within a dualism of unity and dispersion. Is the field of economics opening up to a new heterogeneity of legitimate discourses or is it neoclassical hegemony as usual? Such a clean distinction between a unified and dispersed discursive terrain does not exist for Foucault. Instead of asking whether we recognize theoretical unity or dispersion, Foucault attempts to consider how regularities can be produced in a necessarily heterogeneous and conflict-ridden discursive field. With respect to supposedly unified and fully coherent fields of thought (such as political economy), Foucault remarked:

What appeared to me were rather series full of gaps, intertwined with one another, interplays of differences, distances, substitutions, transformations. (1973: 37)

In both *Machine Dreams* and *Postmodern Moments*, we recognize a similar commitment to the careful study of the complex relations among the regularities and irregularities, unities and dispersions, and continuities and gaps that structure each economic discourse. In Ruccio and Amariglio's text, modern economics is represented as an uneven field of antagonistic discourses—both academic and 'everyday'—that struggle amongst (and within) themselves. This is not to dismiss the possibility of a neoclassical hegemony, but rather to insist that the logic and operation of hegemony is complex. Ruccio and Amariglio's method encourages us to consider the common epistemic ground (unity) that may exist between theoretical opponents (dispersion).

The complexity of neoclassical hegemony is also apparent in Mirowski's text. Yes, neoclassical theory has maintained its hegemony in the face of the cyborg incursion. But, in protecting its identity it was forced to change. In warding off the more radical of the cyborg sciences' implications, economics itself already 'becomes a cyborg science', intimately entangled in the problems of 'information' that lack a clear precedent in the discipline.

Among other economic topics, the reoccurring problems of the socialist calculation controversy are evidence of the centrality of information in post-WWII economics. Mirowski's institutional analysis shows how the socialist calculation controversy, which remains unresolved in fundamental ways, continues to exist at the heart of mainstream economics. In the second section of this paper we hope to show how we can make sense of this controversy with the help of the epistemic approach deployed by Ruccio and Amariglio: What if the reoccurring 'dispersion' of economists across various positions within this debate is made possible by a shared epistemic 'unity' among participants?

The destitution of the subject in modern economics

Foucault concludes his *Archaeology of Knowledge* with the following sensational claim:

If those arrangements [the institutional-epistemic apparatuses of modernity] were to disappear as they appeared... then one can certainly wager that man would be erased, like a face drawn in the sand at the edge of the sea. (Foucault, 1972: 387)

This implies that the figure, the image, the idea of human subject ('Man') is a constitutive product of the modern apparatuses of knowledge and power. On one hand, the category of 'Man' is constitutive of modernity because, for Foucault, all regimes of knowledge/power are predicated upon a particular notion of the subject (Amariglio, 1988). Modern modes of disciplining and studying the subject are only sensible given a particular understanding of what the subject is. For example, Foucault argues that use of the confession (to either priest, doctor or scientist) in the analysis of human sexuality presupposes a centered, coherent and isolatable individual bearing a number of essential characteristics—such as a sexuality. On the other hand, the category of 'Man' is a product of modernity, for the idea of 'Man' is not a trans-historical given, but constructed through the same relations of power/knowledge it makes possible. The propagation of confessional techniques (ranging from the professional psychiatric to the casual and innocuous command to talk about one's feelings in order to be healthy or feel better) re/produces a centered human subject resembling the one presupposed by the confession. In other words, the social compulsion to claim a sexuality

instills within subjects the sense that they are indeed this sort of atomistic agent with a sexual essence. If the ontology of the human subject assumed in theoretical work may be *performative* - which is all the more likely in a discipline such as economics that has been closely related to the production and implementation of social policy - the status of the subject in economics is critical for understanding both economics and the economy.³

Ruccio and Amariglio most specifically take on the theoretical role of the subject in their chapter, 'The Body and Neoclassical Economics.' Their argument is that even within the high modernist project of neoclassical economic theory, we have witnessed a significant break from the modernist and humanist notions of the subject with a centered and unified body. The constitutive product of the classical political economy was the subject qua laboring body. In early 'psychologist' neoclassicism the subject became an enjoying body. In the Arrow-Debreu model (henceforth A-D model), according to Ruccio and Amariglio, the body fragments and disperses into multiple semi-autonomous bodily functions (2003: 110). As Amariglio's 1988 article on Foucault and economics explains, the centrality of a unified and humanist subject is the sine qua non of the modernist episteme. With this in mind the decentered subject within the A-D model can be understood as a postmodern

³ According to Donald MacKenzie, the notion of *performativity* 'points to the fact that the categories of social life (gender is the prototype) are not self-standing, 'natural' or to be taken as given, but are the result of endless performances by human beings and (an actor-network theorist such as [Michel] Callon would add) by non-human entities and artifacts as well. The economy, Callon points out, is performed by economic practices, including marketing and accountancy, and by the all pervasive practices of metrology (the bringing of disparate and what could be regarded as qualitatively distinct entities within standardized systems of quantitative comparison, such as weights and measures)' (2004: 305). In his comprehensive introductory essay to an edited volume of social anthropological studies of markets, Callon uses the concept of performativity in a controversial manner when he concedes the existence of *homo economicus*: '...but [he does not exist as] an a-historical reality; he does not describe the hidden nature of the human being. He is the result of a process of configuration' (1998: 22).

rupture, moment and possibility.

Much of Mirowski's text focuses precisely on how the mainstream has reacted in the (high modernist) post-WWII era to the similar challenges to the same centered and humanist subject that Ruccio and Amariglio see compromised within the orthodoxy itself.⁴ In Mirowski's narrative this threat comes from various 'cyborg incursions' into economics, which present the post-humanist image of the subject as one element within a network that destabilizes the boundaries between man and machine, nature and technology, etc.

In proper Foucauldian spirit, neither Mirowski nor Ruccio and Amariglio respond to these developments with a plea to return the good old days of modernist humanism. Indeed, they both argue that we have not gone far enough in challenging the status of the centered subject in economic theory. If Ruccio and Amariglio's distinction between modernist and postmodernist epistemic conditions allows us to see a possible postmodern subject emerging out of high-brow modernist economics, Mirowski provides the institutional context in which the subject was decentered and problematized in the post-WWII economic thought.

In the second and third sections of this paper we will focus on the two themes that both texts engage: the socialist calculation controversy and the disappearance of the individual/body in modern economics. We hope to show how these two methods of reading history complement one another—or how the questions raised by Mirowski's institutionalist analysis may be fruitfully approached through Ruccio and Amariglio's epistemic method, and vice versa. Together, these complementary methodologies offer a way to understand the potential disciplinary crises found in socialist calculation controversy and the disappearance of the individual/body through their institutional and epistemological contexts.

⁴ Duncan Foley (2004) provides a concise history of the different theorizations of the economic agent from classical political economy to evolutionary economics and socio-biology, including the work of von Neumann and Norbert Wiener.

2. Modernist economics and its discontents

The eternal return of the socialist calculation controversy

In *Machine Dreams*, Mirowski invites us to read the history of the post-WWII mainstream economics as a ‘continuation of the socialist calculation controversy by other means’ (2002: 548). No doubt, the dominant thread of the book is a careful reconstruction of the manifold ways in which the evolution of different skeins of neoclassical economics has been shaped by their collaboration with the US Military and its affiliated research think-tanks such as the RAND Corporation. And no doubt, the central protagonist of the story is John von Neumann—not only because he was pivotal in forging the post-war collaboration between neoclassical economists and the US Military, but also, and maybe more importantly, because his incipient research agenda of developing a theory of automata has unleashed, according to Mirowski, the cyborgification of mainstream economics. Nevertheless, it is the socialist calculation controversy, that endless debate between those who believe in the allocative efficiency of the unfettered markets and those who believe in the necessity of planning to inject rationality and to bring order to the economy, that colors Mirowski’s discussion of the *resistances* of the economics discipline to these cyborg incursions.

In *Machine Dreams*, Mirowski manages to read a significant number of developments and controversies as the continuation of this controversy that began in Vienna in the 1920s. First and foremost, there is the internal split within the neoclassical orthodoxy. On one side of the divide, there was the Walrasian, pro-planning associates of the Cowles Commission with their formal general equilibrium models. On the other side, there was the Marshallian, pro-market Chicago tradition with their ‘partial’ equilibrium models. Second, there is the Arrow’s impossibility theorem, published as a Cowles monograph, regarding the social aggregation of individual preferences. Mirowski reads this exercise, which single-handedly unleashed social choice theory as a separate discipline, as a riposte to Friedrich von Hayek: By proving that an aggregate social preference ordering that would not violate the ‘reasonable conditions’ of rationality could only be generated ‘under dictatorial or imposed regimes,’ Kenneth Arrow was demonstrating to the profession that the only way in which a

rational order could be achieved is through central planning. Third, Mirowski frames the growing fascination for information from 1950s onwards not only in terms of ‘the mandate of the cyborg sciences to explore the various aspects of C³I for the military’ but also in terms of the haunting presence of Hayek and the calculation controversy.⁵ As the reader may recall, Hayek’s central critique of the Lange-Lerner type of general equilibrium models was the problem of ‘knowledge’. Mirowski traces the genealogy of new information economics, at least in those versions that take the A-D model as their starting point (as opposed to the Stiglerian branch of ‘economics of information’ that treats information as just another commodity), to a desire to argue for the necessity of corrective government intervention (and not necessarily for a comprehensive economic planning) in the face of the dawning neo-liberal faith in the capacity of competitive markets to relay information effectively.⁶ And

⁵ Command, control, communications and information (C³I) were the key research areas that the US military imposed upon the scientific community, and the economics profession—at least in the form that it has taken at the Cowles Commission—was more than ready and willing to take on the tasks. According to Mirowski, these buzzwords of hierarchical command have resonated rather well with the economists affiliated with the Cowles Commission because, by early 1950s, they had already ‘become the de facto standard-bearer for the Walrasian pro-“market socialist” position’ (Mirowski, 2003: 241). Many affiliates of the Commission, such as Oskar Lange, Jacob Marschak, Leonid Hurwicz, Tjalling Koopmans, Kenneth Arrow, and Lawrence Klein, were already parties to the socialist calculation debate at one point or another and they invariably entertained a belief in economics as a form of social engineering.

⁶ Mirowski is careful to note that the epistemological status of Hayek’s notion of ‘knowledge’ is radically different from the concept of information that informs the various strands of new information economics. Among others, Bruce Caldwell (1988) and Fikret Adaman and Pat Devine (1996) have taken note of this. See also the recent debate between Geoffrey Hodgson (1998; 2005) and the latter two (2001; forthcoming). Arjo Klamer succinctly formulates the difference: ‘Neoclassical analysis reduces the problem of knowledge to one of information. But having data is one thing, knowing what they mean quite another’ (cf. McCloskey, 1994: 355). Unfortunately, this neoclassical disregard of the difference has proven to be rather obstinate. For instance, John

finally, the calculation controversy appears once more at the end of the century, in the field of experimental economics. In the final chapter of the book, titled ‘Machines Who Think, Machines That Sell’, Mirowski confronts the recent work of experimental economists such as Charles Plott, Vernon Smith, Shyam Sunder and Dhananjay Gode. These scholars claim to have demonstrated that markets do work efficiently, not because individuals are rational but because institutions ‘serve as social tools that reinforce, even induce individual rationality’ (Smith, 1991: 881). While recognizing that institutions do indeed matter, as we will discuss later in more detail, Mirowski carefully demonstrates that these results, far from proving that ‘markets work’, have only shown that there is no such thing as a generic market, but only different kinds of market ‘automata’ (e.g. double auction, sealed-bid, posted-offer).

The postmodern haunting the modern

Because Mirowski does not link these reincarnations of the socialist calculation debate together in a systematic manner, it may indeed be useful to turn to Ruccio and Amariglio to make sense of why these themes recur again and again. Ruccio and Amariglio argue that oppositions such as planning versus markets, order versus disorder, rationality versus irrationality are all binaries that belong to the modernist episteme. In other words, they propose to read the eternal return of the socialist calculation controversy as a symptom of the modernist episteme that enframes the various discourses that are entangled in the controversy.

In a chapter titled ‘Capitalism, Socialism, and Marxian Economics’, Ruccio and Amariglio juxtapose the neoclassical story of ‘invisible hand’ to the classical Marxian ‘logic of capital’.

Roemer, a ‘fifth’ generation Walrasian market socialist, can claim that Joseph Stiglitz’s *Whither Socialism?* (1994) is an anti-Hayekian manifesto (Roemer, 1995). Stiglitz’s ‘information’ based critique of general equilibrium economics, however, cannot supersede Hayek’s ‘knowledge’ based critique of general equilibrium economics for the simple reason that ‘information’ is not synonymous, conceptual speaking, with ‘knowledge.’

[W]hile both construct their conceptions around the modernist opposition between order and disorder, neoclassicals tend to focus on the emergence of order from disorder, while Marxists move in the opposite direction, emphasizing the disorder that is created and reproduced by the underlying order. (Ruccio and Amariglio, 2003: 237)

Therefore, despite their many differences, there is something that Walrasian social engineers, Marshallian Chicago boys, Hayekian neoliberals, and Marxian accumulation theorists share. They all operate within the modernist binary of order and disorder. For Walrasians as well as post-Walrasians such as Stiglitz, order, efficiency, and rationality can be restored if market failures are corrected; for Chicago economists like Milton Friedman, Gary Becker, and George Stigler (the latter extracted from Ronald Coase's 'The Problem of Social Cost' (1960) a 'theorem' that vindicates the superiority of markets over any other institutional arrangement) markets always and invariably work; for Austrian economists the institutions of markets have spontaneously emerged as a result of cultural evolution and the latter 'is in some respects superior to, or "wiser" than, human reason' (Hayek, 1988: 70); and finally for Marxian economists, there is an order underlying the dislocations that the logic of capital accumulation generate and the panacea for the social ills set off by capitalism is socialism (understood by many as 'the elimination of competitive market forces and private productive property' and the conscious institution of 'planned production and coordination among firms' (Ruccio and Amariglio, 2003: 229)). In other words, Ruccio and Amariglio delineates for us the central modernist problematic—a shared commitment to establish a rational order—that brings together what is arguably a rather heterogeneous group of economic traditions.

Nonetheless, it is important to note that Ruccio and Amariglio do not stop there, for they also bring out what they call the 'postmodern moments' within these traditions. Rather than casting modernism and postmodernism in terms of an either/or relationship, that is rather than casting their relation in terms of a binary relationship (which they see as a hallmark of modernist thinking), they prefer to view both 'as constituting horizons or, better said, 'moments' that are, themselves, transient and porous, lacking the ability to suture time and

space—create discernible boundary lines for historical ages or social terrains—in discursive and nondiscursive realms’ (Ruccio and Amariglio, 2003: 28-9). The critical task that is implied by this view:

[...] consists of demonstrating that, despite its best efforts, modernism is unable to close the circle, to completely hegemonize the political, economic, and cultural spaces, and that crucial postmodern moments beckon us toward alternative ways of thinking ‘beyond’ modernism. The postmodern moments that have emerged within fields dominated by modernism adumbrate the paths of its suspension. Thus, to the extent that modernism is seen to produce less than salutary effects, highlighting the postmodern moments within a field can be an immanent critique. (Ruccio and Amariglio, 2003: 29)

They then proceed to find postmodern moments in a number of (sometimes self-consciously) modernist economic traditions. In Keynes and Shackle, they find fundamental uncertainty; in Arrow-Debreu, they find a decentred body; in Feminist economics, they find a certain undermining of the epistemological, or more precisely, positivist certainties of modernism; in Marxian economics, they find a disorderliness of competition that cannot be pinned down to a unified logic; and in Institutional economics, they find an opening of the economic category of value to its contextual and institutional determinations.

To recapitulate, if there is a recurrence of the calculation controversy, if the central debate of the discipline of economics remains to be whether markets are superior to planning or vice versa, this is in part due to the modernism that bathes the discipline in its entirety.

Nevertheless, this recurrence, this eternal return, this impasse could also be read as the ultimate marker of the failure of various faces of economic modernism to close the circle, to master the field, to furnish its customers (governments, research institutes, citizens, and so on) with a final answer as to which one is the more rational way to organize the economy, markets or planning. To put it differently, the very impossibility to put an end to the socialist calculation debate and its recurrence in different theoretical contexts is nothing but a symptom of an underlying identity crisis of modernist economics to establish itself as a unified and singular scientific discourse with a coherent and ‘silver bullet’ policy prescription.

Perhaps more poignantly, the motley of internally heterogeneous and troubled economic discourses could itself be read as a sign that postmodern moments have always—as long as economics has been identified as a discrete discipline—been with us as one of two conflicting logics (the other being the modernist) that constitute that discursive horizon.

3. The destitution of *homo economicus*

From bodily functions...

In ‘The Body and Neoclassical Economics’, Ruccio and Amariglio offer an innovative reading of the A-D model that goes against the grain of numerous critical accounts that narrate the disappearance of the figure of ‘body’ in the highly abstract and dry language of Gérard Debreu’s *Theory of Value* (1959) or Arrow and Hahn’s *General Competitive Analysis* (1971). Ruccio and Amariglio claim that a discourse of the fragmented body can indeed be gleaned even from such highbrow texts of neoclassical theory. In the A-D model, instead of a centered, coordinated, and hierarchically ordered body of the classical political economy and the much-criticized ‘psychologism’ of early neoclassicism, they find ‘a diverse set of bodily surfaces that are written on and of *bodily functions* and orders that are invoked as *economic agencies* in their own right’ (2003: 117; emphasis added). In particular, ‘[w]hile it may still be true that there is often an obligatory nod to the “rational/desiring/maximizing subject”’, Ruccio and Amariglio insist that the axiomatization of economic behavior and the treatment of preference orderings ‘as reflections of choice rather than [its] determinants’, has led modern neoclassical economics to render the forms of behavior as ‘discrete and distributed’ and ‘to attribute *agency* to these *forms* themselves’ (2003: 110-1; emphasis added) rather than to the individuals who enact these forms of behavior. Nonetheless, according to Ruccio and Amariglio, this displacement of agency from *the individual* to *the forms of behavior* does not signify the disappearance of body, but rather constitutes a de-montage of the many functions that were gathered together in the unified body found in classical political economy as well as early neoclassical economics into a disparate and heterogeneous set of ‘bodily functions’. To put it differently, these bodily functions and activities (including, inter

alia, on the side of production, accounting, bookkeeping, assembly, transformation, repackaging, and on the side of consumption, devising a plan of consumption, performing factor services, consuming leisure along with other commodities) that they identify in the A-D model do not refer to a central agency. While each of these functions/activities adhere to a very specific set of assumptions (such as that of the nature of technology and that of preference orderings), it is not necessary to treat these codes as inherent properties of the individual subject. Rather, they argue, ‘the body operates as a surface on which the requirements proposed by the theorists can be inscribed’ (Ruccio and Amariglio, 2003: 116). In short, Ruccio and Amariglio claim that, Arrow, Debreu, and others, in their attempt ‘to displace the deep, hierarchical ordering of the body in favor of theories of consumption, production, and distribution based on the horizontal linkages among a wide variety of bodily functions’, have been led to produce a ‘differentiated and dispersed (what we prefer to call a postmodern) body’ (Ruccio and Amariglio, 2003: 119).

There are a number of important implications of this novel reading of the A-D model. We will touch upon only two of them. The first implication pertains to the concept of *agency*. According to Ruccio and Amariglio, the A-D model does not rely on a unified notion of the individual: In fact, their reading makes it possible to argue that, by mid-1950s, high-brow neoclassical economics has, for all practical purposes, abandoned methodological individualism and embraced the mathematical structuralism à la Bourbaki (see also Weintraub, 2002). In other words, the replacement of the modern unified body by the postmodern bodily functions is itself an (if you like, unintended and contradictory) effect of an underlying movement from the individualist humanism of fin de siècle neoclassicism (‘psychologism’) toward mid-century structuralism. Without doubt, the characteristic operation of structuralism is to dissociate the individual from agency. Nonetheless, in doing so, structuralists have failed to offer a thoroughgoing critique of agency as such and associated the latter, in a pseudo-Hegelian manner, with the structure (Balibar, 2003). In other words, the structuralist critique of the humanist subject has merely displaced what used to be on the side of individual subject onto the structure and thereby remained committed to a modernist and centered understanding of agency. For example, the Auctioneer in the A-D

model, standing in for that absent universal algorithm that will ensure the uniqueness and stability of equilibrium, is that piece of imaginary structure endowed with intentional agency (Amariglio, Resnick and Wolff, 1990). In this particular sense, the continuing normative centrality of the concepts of *equilibrium* and *efficiency* for the neoclassical vision for all practical purposes eclipses the postmodern moment that Ruccio and Amariglio identify in the A-D model.

A second and related implication of this novel reading of the A-D model pertains to the status of the concept of *rationality*. Regardless of what neoclassical economists and their critics have consistently been claiming, there is nothing in the model that implies that rationality is an attribute of the individual human mind. In fact, instead of a hierarchical concept of human body with a rational mind that governs its production and consumption plans, Amariglio and Ruccio find an assemblage of bodily parts that perform various tasks following what neoclassical economists deem to be ‘rational’ rules of conduct. In other words, in these models rationality does not have to be an intrinsic attribute of the human mind; rationality could as well be assumed to be an attribute of the procedures, or to put it in Foucault’s terminology, technologies (*dispositif*) of production and consumption.⁷

If there is nothing intrinsic to the A-D model that makes it individualist, if it is for all practical purposes a structuralist model, then its methodological individualist credentials are nothing but deadweight carryovers from the pre-war neoclassical humanism (‘psychologism’). Indeed, if there is nothing necessarily individualist about its method, we

⁷ Ironically, the treatment of rationality as an effect of particular ‘technologies’ is very close to the positions articulated in institutional economics: ‘All ideas, including beliefs, preferences, and rational modes of calculation, were regarded as evolutionary adaptations to circumstances, *established through the acquisition of habitual propensities* (Hodgson, 1998: 178; emphasis added). In particular, ‘rationality itself is regarded as reliant upon *institutional props*’ (Hodgson, 1998: 180; emphasis added). We believe what Foucault’s concept of ‘technology’ (*dispositif*) has distinct family resemblance to what Hodgson calls ‘institutional props’.

are led to consider what normative commitments may lie behind the practical, institutionally imposed ‘necessity’ of methodological individualism. To the extent that individualism remains hegemonic due to the normative appeal of ‘free choice’ and Pareto efficiency, critics of individualism in the social sciences miss the mark when they attempt to address the issue on a strictly methodological level, and neglect the ideological.

...to markets as automata

Mirowski’s account of the cyborgification of mainstream economics does not only provide the institutional context of this shift towards a flattened and fragmented representation of the body but also brings the more recent developments into the discussion. In fact, it is possible to read the encounter of modernist economics with the cyborg sciences and its resistance towards the more radical implications of the latter, as an encounter of the modern with the postmodern. While this may fly against the common understanding of cyborg sciences as the ultimate ‘modern’ phenomena, the research project that Mirowski gleans out of late von Neumann is more postmodern than modern—at least if these terms are understood in the particular way Ruccio and Amariglio define them.

Even though it was von Neumann who forged the institutional context of the alliance between Cowles and the research initiative of the military, his own research agenda was different from both what the military wanted the economists to do and what the economists wanted to accomplish in collaboration with the military. (Despite the apparent compatibility of the latter two, Mirowski carefully shows that neither the mathematical models of general competitive equilibrium nor the game theoretic research agenda centred on the concept of Nash equilibrium solution had much use in explaining command, control, communication, or information.)

Von Neumann’s project was to develop a theory of automata that would claim ‘as its subject any information processing mechanism that exhibited self-regulation in interaction with the environment, and therefore resembled the structure and operations of a computer’ (Mirowski, 2002: 141). These self-regulating computational machines of various kinds do not

only self-replicate themselves by resisting ‘entropic degradation in a process inherently temporal and fraught with randomness’ (Mirowski, 2002: 141), but also are capable of creating successors logically more complicated than themselves. While von Neumann never had the chance to adequately develop this ‘formalized logical theory of automata’, Mirowski suggests that the entities that would correspond to von Neumann’s automata in economics are markets:

Markets do indeed resemble computers, in that they take various quantitative and symbolic information as inputs, and produce prices and other symbolic information as outputs. In the market automata approach, the point of departure should be that there exists no single generic ‘market’ in any economy, but rather an array of various market algorithms differentiated along many alternative attributes...it is deemed possible (to a first approximation) to code these algorithmic aspects of the particular market forms in such a manner that they can be classified as automata of standard computational capacities and complexity classes. (Mirowski, 2002: 539)

In other words, rejecting a single and generic concept of the ‘market’, the objective of this ‘formal institutional economics’ was to array differential capacities of various market types such as posted-offer, double-auction, clearinghouse, or sealed-bid markets. It is also important to note that von Neumann was not interested in making analogies between the computer and the mind, but, as he himself put it, in dividing ‘all processes into those things which can be better done by machines and those which can be better done by humans and then invent methods by which to pursue the two’ (cf. Mirowski, 2002: 146). This understanding of markets as an heterogeneous set of algorithms, or devices, that function as extensions of human body, stands in stark contrast to the neoclassical appropriation of the cyborg, which has the cognitive agent, assumed to be equipped with a statistical package, mediate and commensurate a range of diverse goals through the instrumentality of a single unique allocation device called ‘the market’ (Mirowski, 2002: 539-40).

This vision of economic institutions as evolving and non-human computational machines (automata) is certainly at odds with the mathematical as well as behavioural economics of the

post-war period which, partly in order to impart scientific legitimacy and partly to defend the basic tenets of neoclassicism against its accumulating criticisms, haphazardly borrowed and analogized concepts from the emerging cyborg sciences and insisted on modeling the human mind as a computational machine.⁸ Remarkably, it is also at odds with the emerging evolutionary game theoretic alternative that continues to rely on the teleological concept of evolutionary stability. While Mirowski acknowledges that, ‘market automata are selected by their environments’ and that this ‘process of selection is biased in the direction of enhanced computational complexity’, he is also quick to add:

...here, as in biology, the jury is still out on this thesis. Because there is no unique function or purpose across the board which a market may be said to exist ‘for’ in this schema, there is no privileged direction to evolution in this economics. (Mirowski, 2002: 544)

In other words, if posted-offer markets survive despite the fact that they are much less efficient than double-auction markets, as experimental economists tend to argue, this does not imply that ‘the great bulk of markets for consumer goods is therefore obsolete or fatally flawed’ (Mirowski, 2002: 560). Even though experimental economists such as Smith, Gode and Sunder try to generalize the allocative efficiency results that they gather from their

⁸ Writing on the future of simulations in economics, Mirowski grants that they ‘will always be an important accessory’ in cyborg sciences, including economics. ‘However,’ he adds, ‘simulations will only be dependably productive in economics when they have been developed and transformed from the status of *representations* to the status of *technologies*’ (2002: 532). This difference between simulation qua *representation* and simulation qua *technology* maps not only on to the difference between the neoclassical domestication of the cyborg and the theory of automata, respectively, but also on to the difference between the modern episteme with its trademark anthropocentrism and the postmodern episteme that dislodges not only the Man but more importantly the very idea of centred agency as such.

double-auction experiments to give substance to Adam Smith's 'invisible hand' scenario,⁹ their results are much more limited in scope and application. If, for instance, as both Smith and Gode and Sunder acknowledge, what makes markets work are the 'trading rules' qua 'social algorithms', then maybe there is something in these results that is contingent upon the particular market algorithm (i.e., double-auction) that is being used. In fact, one is even tempted to argue that results such as Gode and Sunder's constitute a 'postmodern moment' in 'modern' experimental economics where the certainties of the latter discourse are unexpectedly disrupted by its own findings. While Gode and Sunder and Smith argue that the results of their experiments constitute an empirical proof of the age-old neoclassical axiom that markets are efficient, what they actually (and inadvertently) demonstrate us is that there is no such thing as the Market but only a multiplicity of market algorithms with differential computational capabilities.

Mirowski ends *Machine Dreams* by sketching a research agenda of a comparative study of different market automata, a program for a von Neumann-inspired formal institutional economics. He proposes, for instance, to rank order different market automata according to a *variety* of quantitative indicators, such as timeliness, transparency, orderliness, stability, and so on, and not only according to allocative efficiency. 'Indeed,' Mirowski argues, 'we might subject each market automata to an effectiveness audit, running down the prospective list of all things we think it is that markets do, and evaluating their computational capacities to attain each objective' (2002: 558). In these final pages, Mirowski imagines a formal institutional economics that would be sensitive to the plurality of market forms and that would not essentialise a single and unique efficiency criterion. This would be an economics that acknowledges that the 'economy' is like a 'text' and just like any other text it would be without 'a single fixed and stable referent' (Mirowski, 1991: 565).

⁹ Gode and Sunder (1993: 136): '[W]hen embodied in market mechanism such as a double auction, [invisible hand] may generate aggregate rationality not only from individual rationality but also from individual irrationality.'

4. Conclusion

It is common for heterodox economists to question the status of neoclassical theory. Is it still dominant? Does it even still exist? What is the identity of contemporary mainstream economics if it is not neoclassical? *Machine Dreams* and *Postmodern Moments* contribute to these concerns by complicating the ways in which we understand disciplinary dominance, existence and identity within economics. In this context, the major implication of these works is that the perceived disciplinary crisis that motivates our questioning of the status of neoclassical theory today is far from new. The joy of reading these two texts together is the distinct, yet complementary, methodologies they employ in making this point. In Mirowski's institutional-historical analysis the production of mainstream economic theory has always been contaminated by alien disciplinary and political elements. Ruccio and Amariglio's philosophical approach to economic theory insists that every discourse is necessarily complicated and dispersed – within the most modern of discourses exist a multiplicity of positions and even postmodern ruptures.

The case of the socialist calculation controversy is one example of the complicated, and not mutually exclusive, relationship between discursive unity and dispersion. Mirowski's narrative makes two features of the socialist calculation controversy clear. First, it takes place within a complex political, technological and institutional environment. Second, even though these debates are largely shaped by the prerogatives of the cyborg sciences, they remain absolutely fundamental to economics, reoccurring in a number of forms. Ruccio and Amariglio's approach suggests that a shared epistemic modernism, in particular the binary between order and disorder, held by both sides explains the continued importance of the debate. In other words, the debate is fueled as much by a modernist agreement that the economy must be organized in one unique way (planning or markets) so as to preserve order as it is by any set of disagreements. Yet, however predominantly modernist this debate may be, it is also the site of various postmodern moments. On one level, theory and experience undermine the simple identity of markets and planning. There is no Market, but rather different markets. Planning itself is a process in which 'contention, conflict, and difference

enter at every stage' (Ruccio and Amariglio, 2003: 234). On another level, the inability of economics to transcend this debate can be read as indicative of a fundamental ambiguity between order (and how to achieve it) and disorder (and how to prevent it), suggesting economics may be best served by leaving this modernist binary behind.

The identity of the human subject is another place in which the unity and identity of economics is complicated by these texts. Ruccio and Amariglio find a decidedly non-humanist notion of agency in the A-D model. Given the centrality of individualism to neoclassical economics, this seemingly postmodernist and decentered subject at the heart of microeconomic theory raises an interesting question. If traditional individualism is not only unnecessary, but even perhaps methodologically contrary, to the thrust of the 20th century microeconomics what are we to make of the continued insistence upon methodological individualism? Mirowski's narrative provides a historical context for the decentered subject of the A-D model. If this assemblage of heterogeneous procedures and bodily functions that Ruccio and Amariglio find in the A-D model appears foreign to the discipline of economics (with its tradition of centered laboring or enjoying subjects), it does seem familiar to the cyborg sciences. Yet, this cyborg influence is not without its corresponding neoclassical domestication. The cyborg ontology of agency is only allowed in to the extent that a complicated man-machine interface can be forced into the neoclassical category of the individual. Nonetheless, this new cyborg ontology of agency is neither simply on the side of the machine nor on the side of the man but in between, in the moment of articulation of the machine as an enabling prosthetic device with the man.

And perhaps, therein lies one important lesson that we can draw from reading these two books together: The promise of moving beyond the perpetual state of crisis of identity that haunts modern economics will never be realized unless we cease to understand the world we live in terms of modernist either/or binaries, such as order and disorder, markets and planning, man and machine, and maybe most importantly, economics and history of economics!

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