THE EPICYCLES OF GENERAL EQUILIBRIUM THEORY

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I
INTRODUCTION

In 1991, Ronald Coase was awarded the Nobel Prize in Economics for “his discovery and clarification of the significance of transaction costs and property rights for the institutional structure and functioning of the economy.” In its citation, the prize committee explained: “[i]n perhaps somewhat pretentious terminology, Coase may be said to have identified a new set of ‘elementary particles’ in the economic system.” This comparison is perhaps less “pretentious”—an odd kind of humblebrag by the Swedish Academy— than it is revealing and, I argue, ultimately misleading. What would it imply about “the economic system” if it could be conceptualized as if it were composed of...

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* Professor of Law, Berkeley Law School, University of California-Berkeley. I became interested in the concept of transaction costs over twenty-five years ago while writing my undergraduate senior honors thesis on the problem of “adaptationism” in the history of economic thought. For their engagement with my ideas about transaction costs since that time, I am grateful to Christian Barry, Daniela Cammack, Guido Calabresi, Jules Coleman, Dario Gil, Walton Green, Robert Hockett, Ro Khanna, Steven Marglin, David Menschel, Jedediah Purdy, Sanjay Reddy, Annaelese Riles, Bella Sewall, Marco Simons, Ian Simmons, Talli Somekh, Peter Spiegler, Talha Syed, Richard Tuck, and Roberto Mangabeira Unger. In earlier decades, some of these friends were subjected to unpublished and indeed unpublishable treatises on the subject. More recently, Amy Kapczynski, Jedediah Purdy, Sabeel Rahman and I co-authored an article that explored some of these themes, and which I draw on here with gratitude. For their input, advice, and criticism on the present article, I am grateful to Eero Arum, Daniela Cammack, Christine Desan, Hanoch Dagan, Roy Kreitner, Lev Menand, Ralf Michaels, Lucas Osborne, Jedediah Purdy, Sanjay Reddy, and Peter Spiegler. The first draft of this paper was presented at a Safra Center conference at Tel Aviv University on the “Methodological Tensions in Understanding Markets,” December 14-15, 2022, and I wish to thank Oren Bar-Gill for his formal comments, as well as all the other participants, particularly Christine Desan, Rachel Friedman, and Katherina Pistor, as well as organizers Hanoch Dagan, Roy Kreitner and Ralf Michaels. All errors are mine, as per the usual.

1. I will refer throughout this article to the “Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel” as the Nobel Prize in Economics. Though it was not a prize original to Nobel’s vision, the Bank of Sweden instituted it in 1969 when, in its estimation, economics had achieved sufficient precision to count as a science. For a history of this prize, see generally AVNER OFFER & GABRIEL SÖDERBERG, THE NOBEL FACTOR (2016). For the first chairman of the prize’s view of economics as a mature science, turn to Id. at 58.
3. Id.
particles—and, moreover, particles that might be unknown to us, such that a new set of them could have been identified by Ronald Coase? And if we were to persist in this analogy to particle physics, what implications would follow for the study of markets across the different academic disciplines?

As Marietta Auer, Hanoch Dagan, Roy Kreitner, and Ralf Michaels suggest in their Introduction to this Special Issue, the study of markets provides a signal instance of the tension between conceptual and historical analysis in the human sciences. This is both because markets are concrete historical institutions susceptible of comparative and genealogical study and because the dynamics of market exchange have been abstracted into what they call a “generalized way of thinking about interaction.” In this article, I examine the shift in conceptual technique that helped make possible the abstraction from concrete markets to a “generalized way of thinking about interaction,” which effectively turns “the market” into an economic version of that “brooding omnipresence” from which Oliver Wendell Holmes was so keen to distinguish the common law. I focus in particular on the way that a highly abstract model of generalized economic interaction captured in mid-twentieth-century general equilibrium theory of the Arrow-Debreu variety was transposed into non-market domains via a series of auxiliary theories, most importantly, transaction costs and the associated concept of externality.

In the closing decades of the twentieth century, a wave of social and historical science following Coase’s lead posited the management of transaction costs as the central problem of social organization. The power of transaction cost analysis is revealed by the many Nobel Prizes in Economics awarded to research deriving from it. If considered broadly to include deficiencies or asymmetries in information, these would include the prizes in 1991, 1993, 1996, 2001, 2009, and 2010. The Nobel Prizes awarded in the early 1990s prove especially revealing about the shape of current political economy and related practices of interdisciplinary social science. After Coase’s award in 1991, his University of Chicago colleague Gary Becker won the prize in 1992 for the extension of microeconomic methods to “human behaviour and interaction, including nonmarket behaviour.” The 1993 prize went to Robert Fogel and Douglass North for having “renewed economic history by applying economic history and quantitative methods to explain economic and institutional change.”

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Afterward, in each of the following three years, the prize went to related areas of research aimed at bringing messy institutional realities within the scope of the core models of general equilibrium theory. First, in 1994, it went to three pioneers of game theory, John Harsanyi, John Nash, and Richard Selten, for showing how equilibria emerge in “non-cooperative games.” Then, in 1995, it went to Robert Lucas for his work on “rational expectations” in macroeconomics. Finally, in 1996, it went to James Mirlees and William Vickrey, for their studies of “asymmetric information,” a concept closely linked with transaction cost economics. Later Nobel Prizes consolidated this trend: in 2001 for further studies of “asymmetric information;” in 2009 to Oliver Williamson, for his work on the “new institutional economics,” including the “boundaries of the firm;” and in 2010, for models of “markets with search frictions.” Additional Nobel Prize-winning research across several decades has shared the ambition of applying microeconomic theory to novel areas of study, as in much of the work on “behavioral economics,” including by 2017 laureate, Richard Thaler.

The research behind these many awards has sought to adapt the framework of general equilibrium theory beyond its core focus on price-governed markets. In addition to “law and economics,” with which Coase’s award was especially associated, the concept of transaction costs has been foundational to much of this work, including in the “new economic history,” the “new institutional economics,” and the economics of asymmetric information. Through this research, microeconomic theory has been applied to social practices and institutions more typically encountered in fields such as law, history, business, and psychology, which do not take formal market transactions as their central object of study. Doing so has required deploying the basic method and core models of neoclassical microeconomic theory to analyze non-market contexts, mainly by elaborating the constraints to which individual rational choice is to be considered responsive even in the absence of any explicit price signal.

This approach now structures neoclassical political economy, broadly conceived. Historically specific non-market institutions and practices are
accommodated within the constitutive models of twentieth-century economics through the discovery of proxies, parallels, or substitutes for the price system at the core of microeconomic theory. The defining assumption that enables this accommodation is that human action, even in unpriced contexts, is best understood as rational choice-making under scarcity. The model of rational action developed for the analysis of consumer choice was thus transferred to what had seemed to be much less promising domains in the neighboring social and historical sciences.

This theoretical expansion has raised the question whether the constitutive models of neoclassical economics, best captured in mid-twentieth century general equilibrium theory of the Arrow-Debreu type, can prove useful even in institutional contexts that do not conform to their strict initial assumptions. To make this expansion possible, I argue, several “auxiliary theories” or “linking assumptions” proved necessary and gained prominence in the generation after the high point of general equilibrium theory, most prominently transaction costs and externality. By analogy to the auxiliary theories that saved the geocentrism of Ptolemaic theory from empirical disconfirmation, I argue that transaction costs and related conceptual framings are best understood as the “epicycles” of general equilibrium theory, not as elementary particles on an analogy to subatomic physics. These auxiliaries have allowed neoclassical economics the surprising feat of reorganizing interdisciplinary inquiry in social science and history under its aegis, even while the manifest lack of realism in its core models is fully acknowledged, especially by economists themselves. Empirical
disconfirmation—or, more modestly, the difficulties of positive empirical verification—do not seem to undercut these models, because attention is directed to the secondary or ad hoc auxiliary hypotheses that work to shield the core model, along the lines first discussed by Pierre Duhem and later elaborated by Willard Quine and, more recently, Nancy Cartwright.16

To advance this argument, I first offer a brief intellectual history of the origins of the concept of transaction costs, revealing multiple and distinct usages of the term across the major literatures. My survey will obviously be highly selective, for reasons of space. I then suggest that we may make the concept of transaction costs more concrete by deepening the usual analogy to physical friction, which reveals transaction costs as contestation over the property relation. I then suggest we make the concept more abstract by focusing on the conflation of several distinct “orders”—nested levels or hierarchical orderings—of transaction costs, which reveals these costs as the nested difficulties of institutional change. Pushing the concept toward both greater concreteness and greater abstraction reveals it as critically underdetermined with respect to several key desiderata of any explanatory concept. The combined effect of these maneuvers is a refocusing of political economy on the complex and multi-layered contestation over the institutional foundations of exchange, which cannot be reduced to an exercise of constrained maximization by narrowly incentivized agents.

Examining these complexities invites the question as to why the concept of transaction costs has become so popular across a variety of contemporary scholarly literatures. Answering that question requires forgoing the simple view that the concept describes something that is out there in the social world, on an analogy to the discovery of an elementary particle or the measurement of physical friction. The answer requires, instead, considering the role that the concept has played in securing a broader theoretical framework behind it, as Ptolemaic epicycles secured the geocentric model of the solar system. I end this article by suggesting that transaction costs and other such auxiliary theories have played a crucial role in fitting general equilibrium theory to non-equilibrium market and non-market contexts.

16. Auxiliary theories that shield a core theory from direct verification are sometimes called “ad hoc hypotheses” though whether all ad hoc hypotheses function as auxiliary theories (and vice versa) is beyond my scope to investigate here. The epicycles of Ptolemaic theory prove a famous example of ad hoc auxiliary hypotheses. They also probably impart skepticism about the use of auxiliary theories in model-building but it is worth noting that ad hoc hypotheses are not necessarily incorrect or unhelpful, only that, on an account that emphasizes the minimization of premises to an argument, they are undesirable. On Quine-Duhem, see HARDING, supra note 14; and for an overview of Cartwright’s work in this area, see generally Nancy Cartwright et al., Theories of Scientific Method: Models for the Physico-Mathematical Science, in 5 THE CAMBRIDGE HIST. OF SCI. 19, 30 (2003).
II

WHAT ARE TRANSACTION COSTS?

What are transaction costs? In this Part, I offer a brief overview of the prominent usages of the concept, before pushing the concept first in the direction of more concreteness and then in the direction of greater abstraction. The combined effect of these maneuvers is a refocusing of political economy on complex and multi-layered contestation over the institutional foundations of exchange which cannot be reduced to an exercise of constrained maximization by narrowly incentivized agents.

A. A Brief History of Transaction Costs

The beginning of the transaction costs literature is usually dated to a 1937 paper by Ronald Coase, which theorized “the costs of using the price mechanism” to explain the persistence of firm hierarchies alongside price-mediated markets. However, it was not until Coase’s 1960 paper The Problem of Social Cost that the concept was used directly in legal analysis, with which it thereafter became prominently associated. The broad concept was not novel: the fact that it can be difficult to conduct an exchange was obviously well known—and relied upon as part of policymaking—well before his mid-twentieth-century conceptualization. What was significant about Coase’s work was his definition of the concept with an eye to its deployment as part of a general argument about the institutional structure of the economy, understood now as the operation of a “price system.”

To explain Coase’s argument, a physical analogy has often been relied upon, with transaction costs frequently described as “friction,” rather than the Nobel committee’s “elementary particles.” As a later Nobel Prize winner, Oliver Williamson, put it succinctly: “Transaction costs are the economic equivalent of friction in physical systems.” Indeed, in economic discussions, “friction” is often
used as a synonym for transaction costs, or at least a kind of standard shorthand. A *Boston Globe* article from the time of Coase’s Nobel Prize award quotes his colleague summarizing Coase’s discovery. “‘Friction,’ summed up Richard Epstein, a University of Chicago [law] professor. ‘Friction, friction, friction, friction.’” It is as “friction” that the concept of transaction costs does its most important work in serving as a bridge between the frictionless model of a general equilibrium economy and the real world of allegedly “messy” institutions—that is, institutions that do not appear as the direct result of rational behavior according to price-mediated incentives. As early as 1979, Carl Dahlman observed that transaction costs had “become a catch-all phrase for unspecified interferences with the price mechanism,” and noted that a full parameterization of transaction costs would make any system appear optimal, a problem Guido Calabresi has called the “pointlessness of Pareto optimality.”

Going beyond interference with the price mechanism, the concept now stands in for the difficulty of institutional change generally, both within formal markets and beyond them—thus, friction not only in price-mediated markets but in the economy, understood as the social universe. This high level of abstraction in conceptualizing transaction costs may not have been a problem for a concept designed as an abstraction, but it proves curious given that the concept was proposed as a reality check on abstraction. Thus, when we seek real-world examples of transaction costs, we come across an expansive and scattershot list of apparent problems: technological, social, economic, administrative, communicative, informational. These problems can all prove real enough if delimited properly, and can, in some fashion, make exchange more difficult—that is, more costly. But the list of impediments to frictionless exchange is open-ended: push further and every impediment is revealed as the product of other background social and economic processes, which themselves must then figure in the identification of the relevant cost. To begin an inquiry into the nature of transaction costs thus takes you from an abstract notion meant as a corrective into more solid terrain—actual social and economic relations—but then back out again to abstract arguments about social structuration. This explains why it is possible that, beyond strictly formal transacting, the concept has been utilized to explain impediments to—that is, failures to achieve—individual rational choice, conceived on a model of exchange, even while transaction costs are

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simultaneously summoned to argue that apparently non-rational choices are indeed rational once this broader set of costs is admitted into the optimization problem.

This malleability or open-endedness of the concept of transaction costs has suggested to many observers that it is empty—that it does not clearly correspond to any determinate or identifiable set of real-world costs. Instead, the concept seems to require ad hoc specification for each new research question. Thus, in practice, we rely on a specific notion of transaction costs relative to a given inquiry—for example, redescribing the costs of contracting in the incomplete contracts literature as transaction costs—but then justify that redescription through a general notion that relies on analogy—for example, friction or elementary particles in an economic system. As a result of this malleability, the specific instances allegedly corresponding to the concept have expanded beyond the original core definition: as we deepen our understanding of economic processes and the institutional foundations of markets, we find “transaction costs” cropping up everywhere and in overlapping fashion.

To be precise, this tendency to emerge in new contexts is not by itself a problem. Philosophers of science distinguish the intension of a concept, related to its internal content or formal definition, and its extension, meaning its application to particular objects or contexts. The ongoing discovery of new kinds of transaction costs could suggest merely an additional range of applications for a stable underlying concept. The deeper problem is that the intensional definition is underdetermined, which allows for a seemingly unlimited extension of the concept with ad hoc justification in each case.

In the final analysis, the only category of costs which appears firmly secure against incorporation into the transaction cost framework may be monetized production costs themselves: short of these production costs, all other costs in the economy may be considered as costs attending a transaction, however remotely. Given this expansion of the concept, Calabresi and others have questioned whether optimality and efficiency remain useful concepts, given a full parameterization of all possible transaction costs. As I argue over the next two Parts, one way of salvaging something from this otherwise fatal open-endedness may be to push the concept both in the direction of greater concreteness and in the direction of greater abstraction.

26. On the problem of sense-making in semantic theory, including the distinction between intensional and extensional definition, see generally David Chalmers, Sense and Intension 16 PHIL. PERSPS. 135 (2002). Thanks to Peter Spiegler for help throughout this article, as well as this specific insight.
27. See Calabresi, supra note 23.
B. Toward Greater Concreteness: Contestation Over Property

Pushing the concept of transaction costs in the direction of greater concreteness requires revisiting the conceptualizations of transaction costs proposed by four of the Nobel laureates discussed above—Ronald Coase, Kenneth Arrow, Douglass North, and Oliver Williamson, arguably the four central figures in the transaction costs literature. What Coase originally named, and what was later developed into the more general concept of transaction costs, was the “cost of using the price mechanism”—which he also described as “marketing costs” or the “cost of carrying out exchange using the open market,” and, later, as “the cost of market transaction.”

Coase’s original definition has been detailed to include the standard definitions of transaction costs that are customarily repeated in the literature: the costs of bargaining, contracting, and contract enforcement as well as the discovery or exchange of information. There have been various approaches to their further subdivision: Robert Ellickson, for example, has divided Coasean transaction costs along two axes: chronological (distinguishing “pre-bargain,” “bargain,” and “post-bargain” stages) and functional (distinguishing “get-together costs,” “decision and execution costs,” and “information costs”).

Related to these categories in the law and economics literature is the idea of “strategic behavior” generating transaction costs in bargaining or quasi-bargaining contexts.

Following Coase, economist Kenneth Arrow proposed a more general view of transaction costs, characterizing them as “the costs of running the economic system,”—in other words, all costs other than production costs. Arrow’s definition is thus expansive, arguably even comprehensive. While Coase’s original definition is perhaps most prevalent in the law and economics literature, the Arrovian definition better matches the way that the concept of transaction costs has been utilized in economic history and related areas of contemporary political economy. These fields employ the notion to encompass costs beyond those originally envisioned by Coase—namely, a vast array of logistical difficulties and challenges attending institutional and organizational change. Note that these costs are not part of any transaction in an obvious sense, at least not a specific market transaction.

Employing Arrow’s more general concept in an expressly sociohistorical...
frame, economic historian Douglass North has defined transaction costs as “the basic determinants of institutions” and “the framework within which economic activity occurs.” North is explicit that conceptualizations of transaction costs differ across disciplinary contexts:

The economist is concerned with analyzing the performance of an economy within a given set of constraints. The economic historian, by contrast, focuses on how the constraints change over time. The very definition of transaction costs we [historians] must employ differs from that typically used by economists.

North’s sweeping conceptualization of transaction costs has been central to the development of several subfields of political economy, including the “new economic history” and “new institutional economics.”

Finally, in a move to ground the concept for purposes of comparative organizational assessment, Oliver Williamson began with the main analogy—"transaction costs are the economic equivalent of friction in physical systems"—before attempting to derive this abstraction from an underlying account of human behavior. According to Williamson, transaction costs arise in the design and implementation of strategies to deal with two pervasive behavioral facts: what he calls “bounded rationality” and “opportunism,” which have no exclusive institutional purview and so condition all institutional innovation, whether within formal markets or beyond them. Williamson’s conceptualization followed more directly from Coase’s definition and attempted to deepen the concept by relating it to stylized behavioral facts. Nevertheless, by grounding his conceptualization in a psychology of incentives, he moved away from the Coasean focus on specifically market transactions as the baseline and turned “transaction cost economics” into a general comparative analysis of governance mechanisms across a range of institutional and organizational settings. This reframing has made his conceptualization particularly useful in management studies, updating the theorization of the comparative costs of market and hierarchy from Coase’s 1937 article.

As these examples indicate, different subdisciplines of political economy have employed distinct conceptualizations of transaction costs within a common framing. Is there any phenomenon or set of related phenomena to which the concept of a transaction cost clearly corresponds such that we could make it more concrete? It is worth noting that most of the costs discussed can be grouped into one of two non-distinct categories: the costs of what we might call property

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34. See WILLIAMSON, supra note 20, at 19.

35. In bringing bargaining and others costs into the concept of transaction costs, Williamson expressly follows Arrow’s capacious definition of transaction costs, calling it “a more useful and natural way to proceed;” see OLIVER WILLIAMSON, THE MECHANISMS OF GOVERNANCE 161 (1996).
contestation; and problems of “information,” meaning deviations from an assumption of comprehensive knowledge about consequential outcomes. Both categories are familiar in the contemporary political economy literature.

The first category, property contestation, includes the costs of defining, demarcating, and protecting the relevant property to be traded—the pre-transaction property bundle—and the costs of negotiating the transaction to be undertaken—the post-transaction property bundle—including bickering over any ex post enforcement and expected flows of benefits from any shared arrangement. The second category, “information costs,” proves a vast and heterogeneous group. Nevertheless, in a very general way, we can say that information plays a critical and complex role in any transaction, though it is often taken for granted. Much of the contestation over property may be over relevant information about property—about expectations of use and change—which serves to define property, sometimes constitutively. The various problems with information that have been conceptualized as transaction costs—its imperfection or asymmetry across the parties, its misuse as part of strategic behavior, or a lack of information about likely outcomes—can be understood as contestation over the boundaries of property rights. Thus, more concretely, we may conceptualize transaction costs as the problems of navigating the zones of contestation and uncertainty in any given bundle of rights. The constant turn to friction as an analogy illustrates the point: what else besides contestation over property could the “economic equivalent of friction” be? Practically, then, the research design for transaction costs analysis should shift from the attempt to identify friction or elementary particles conceived as somehow outside or adjacent to the problem of property in exchange to the problem of the unstable definition of the commodity itself.

C. Toward Greater Abstraction: Nested Costs of Change

The claim that transaction costs reduce to contestation over property rights and associated coordination failures may strike an economist as pedestrian. But it is specifically the problem of property in exchange which these costs are meant to describe, because contestation over property in this respect only arises when one set of rights comes up against another in the interaction between rights-holders in commodity exchange. From this insight, we can push the concept in the direction of greater abstraction by inquiring into the relation between property rights and the institutional mechanisms by which they can be transferred—commodified—and the comparative costliness of different such mechanisms.

Following Coase, we might say that it costs something to transact in markets. Suppose that to transact we must employ a certain technology: a transaction technology or transaction machine. The idea of a transaction machine is no
longer merely metaphorical, given today’s automated and so-called “smart” contracts; indeed, contracting is sometimes even depicted at this level of abstraction in the economic theory and legal literature.\footnote{37} We wind up this transaction machine—pulling the right levers and pushing the right buttons—and transactions are produced. Of course, it costs something to operate this machine, and these would then be transaction costs. Or, to employ a different metaphor to the same end, we might ask: what are the wages of the Walrasian auctioneer? If he must be compensated for overseeing the process of \textit{tâtonnement}, the wages paid for all that shouting are precisely the “cost of carrying out exchange using the open market,” as Coase originally put it.\footnote{38}

However, as soon as we conceptualize transaction costs as the costs of running a machine that produces transactions, or else as the wages of the Walrasian auctioneer, we cannot escape thinking about this machine in the way we think about other machines. We will want to ask: how much do these machines cost? Are there different grades of machines? Equivalently, how much are auctioneers of different skills paid? Can one build a better transaction machine that produces more transactions at less cost? And how much would it cost to do so?\footnote{39} The moment we push the concept of transaction costs to this further level of abstraction—changing the cost of producing transactions—we must conceive the costs of transacting in a market as varying with different possible transaction machines, each with a particular cost profile. Indeed, given the metaphor of a transaction machine, the idea of a market in transaction machines becomes almost inescapable, as does the idea of investing in the production of new, and more efficient, transaction machines.\footnote{40}

Supposing again that these market transactions are in turn undertaken by employing a transaction technology or a transaction machine, we will have transaction machines used to produce transactions in markets for transaction machines. Of course, we must in turn recognize that it will cost something to operate these machines transacting in transaction machines. (Yes, it is ‘turtles all


\footnote{38} See \textit{COASE, supra note 28, at 45}.

\footnote{39} While I have posited this problem at a high level of abstraction, it is worth observing that these difficulties come up in the market design or, more broadly, mechanism design literature in economics and may have practical import in that connection. See generally Alvin E. Roth, \textit{The Economist as Engineer: Game Theory, Experimentation, and Computation as Tools for Design Economics}, 70 \textbf{ECONOMETRICA} 1341 (2002).

\footnote{40} In other words, the best way to dissolve one fallacy of aggregation—that of “transactions” and their “costs”—may be through the introduction of another fallacy of aggregation, a “production function” for transaction, which is the kind of move that Piero Sraffa might have appreciated. See \textit{PIERO SRAFFA, PRODUCTION OF COMMODITIES BY MEANS OF COMMODITIES: PRELUDE TO A CRITIQUE OF ECONOMIC THEORY} (1960).
the way down’ in this universe). What are the costs of running these machines? What are the costs of undertaking transactions in transaction machines? They would be the costs of transacting for new technologies of transaction, in other words, the costs of establishing different regimes of transaction. Or, to develop the other metaphor, we must conceptualize a Walrasian auction for Walrasian auctioneers, superintended by an auctioneer of auctioneers, who himself demands a wage for this higher-order process of tâtonnement in search of lower-order tâtonnements — that is, those who do further tâtonnement.

To avoid confusion, let us call what Coase termed “the costs of using the price mechanism” first-order transaction costs, while this second set of costs—the costs of establishing a different regime of transaction—would then be second-order transaction costs. At present, these two different orders of cost are routinely conflated in the literature, which does not adequately distinguish the costs of conducting a given transaction from the costs of establishing the institutional structure within which a given transaction takes place. While first-order transaction costs might include measurement, enforcement, and bargaining problems of the usual kinds, second-order transaction costs would then comprise the costs of changing the institutions which determine those first-order transaction costs: devising and instituting better measurement systems, enforcement mechanisms, bargaining methods, and so on. First-order transaction costs arise within a given structure once we conceive friction in the operation of governance institutions; second-order transaction costs arise once we acknowledge that institutional change is both possible and “costly”— that is, difficult.

Here, we can usefully adapt Alvin Klevorick’s concept of the “transaction structure” to distinguish between transaction costs and transaction structures. The costs accompanying a given transaction and costs of altering the transaction structure are currently aggregated or undistinguished from each other, even though they are, in fact, nested costs because the transaction structure determines the costliness of given transactions within it. The prevailing conceptions of transaction costs nevertheless fail to disambiguate the costs attending a given transaction and the costs of establishing the institutional structure within which any given transaction takes place. These are often simply conflated: the costs arising from any given transaction and the costs of operating the transaction structure in which that specific transaction occurs are aggregated without necessary distinctions. Again, however, the costs of any transaction depend upon the transaction structure that enables it to be carried out in one way, with its attendant costs, rather than another. Thus, transaction costs as Coase described

41. See COASE, supra note 17, at 390.
42. Klevorick describes the “transaction structure” of society: “Society (or the collectivity or the state) establishes a ‘transaction structure’ that stipulates the terms on which particular transactions or exchanges are to take place under different circumstances.” I take this term to mean the broad institutional structuring of the economy, in the sense that it determines who can exchange which entitlements with whom, and under what conditions, see Klevorick, supra note 24.
them, “the costs of using the price mechanism,” actually depend upon transaction costs as Arrow described them, “the costs of running the economic system”—that is, of managing the institutional framework of transacting.

With this distinction in mind, transaction costs may be usefully disaggregated into a few distinct notions: first, the difficulties within a given system which are barriers to efficient transacting—first-order transaction costs. Second, the difficulties of moving between different systems of transaction—second-order transaction costs. And then nested higher-order costs of change, to the extent these become relevant to any institutional inquiry—third-order, fourth-order, fifth-order costs of change, and so on. Higher-order costs of transaction may prove relevant to some inquires, as for example in “constitutional economics,” where the focus is on the amendment of rules that structure downstream changes to the rules that make up the transaction structure, which enables transacting on specific terms.

As noted above, a framework of higher-order transaction costs is implicit, if undeveloped, in much of the literature. Recall the way that Douglas North discussed how transaction costs are used in economic history: “[t]he economist is concerned with analyzing the performance of an economy within a given set of constraints. The economic historian, by contrast, focuses on how the constraints change over time. The very definition of transaction costs we must employ differs from that typically used by economists.” Earlier in that same article, North used an expansive version of the concept, defining transaction costs as “the basic determinants of institutions” and “the framework within which economic activity occurs.” North is here suggesting different orders of transaction costs because, on his understanding, the economic historian is focused on changes to the constraints on economic performance, which I have here called second-order transaction costs, while the economist focuses on the costs to transacting within a given set of institutional constraints, which I have here called first-order transaction costs. More generally, some elaboration of this kind seems implied in the expansion of the concept from Coase’s original definition, where transaction costs represent merely the obstacles to specific transactions, to Arrow’s view of costs, which come to include the costs of managing entire systems of transactions.

The move to greater abstraction has revealed a framework of multiple orders of transaction costs. This greater abstraction can be combined with the move to greater concreteness, which revealed transaction costs as contestation over the property relation—that is, the difficulties in making any bundle of property rights in exchange precise and secure. Both moves are implied in the very concept of a transaction, which links an idea of change to an idea of property. Transactions

43. Coase, supra note 17, at 390.
44. Arrow, supra note 31, at 48.
47. Id. at 255.
are changes of a specific kind: changes in the composition of bundles of property rights secured within a broader legal framework. Once we recognize that there are costs to changing any property bundle, we should obviously consider the costs of changing those costs, admitting the possibility of changing the means of change, and thus the second-order costs of any such change. This kind of multiple-orders analysis can be carried on until the operations involved become overtly social-ontological, which is beyond the scope of the present article. But it is worth observing in passing that any claim to property is only comprehensible within a system of property rights that any individual claim both presupposes and instantiates, especially when it is altered through transactions, while reciprocally, a system of property rights requires such ongoing and concrete instantiations to persist in its core logic. Something like multiple orders of transaction costs may thus be prefigured in the general concept of property as a right or legal relation, which comes to the fore in the analysis of exchange more readily than in the idea of property as simply the possession of something by an owner, a reification useful for some conceptual purposes which may nevertheless hinder others. Taking these points seriously suggests a reorientation of political economy to illuminate a complex and multi-layered contestation over the institutional foundations of exchange, which cannot be reduced to an exercise of constrained maximization by narrowly incentivized agents.

III

INSTITUTIONS IN EQUILIBRIUM

In this Part, I turn to consider the role that the concept of transaction costs, and the associated concept of externality, has played in the popularization of general equilibrium analysis. It is otherwise hard to understand the centrality of these underdetermined conceptualizations to contemporary political economy.

A. The Success of General Equilibrium Theory

The emergence of the “law and economics” movement of the later twentieth century must be situated in relation to the consolidation of a particular approach to economic analysis in the middle of the twentieth century. Scholars associated with the “new welfare economics” of the 1930s and 1940s elaborated the analytic core of economics that persists today, which was formalized in the 1950s and 1960s using new mathematical techniques that allowed for an axiomatic solution

48. Some discussions of the “value-form” of the commodity may be useful in this respect, if only to prompt an inquiry into their legal foundations; see KARL MARX, THE VALUE-FORM: APPENDIX TO THE FIRST DRAFT OF CAPITAL, REPUBLISHED: CAPITAL AND CLASS 130–50 (Spring 1978); ISAAC ILLICH RUBIN, ESSAYS ON MARX’S THEORY OF VALUE (Miloš Samardžija & Fredy Perlman trans., Black & Red 1972).

49. For a sketch of how this contestation could be analyzed, see David Singh Grewal, The Legal Constitution of Capitalism, in AFTER PIKETTY: THE AGENDA FOR ECONOMICS AND INEQUALITY 487 (Heather Boushey et al. eds., 2017).
to the longstanding problem of “general equilibrium”—that is, the formal description of the economy as a generalized system of inputs and outputs regulated through price signals, rather than a “partial equilibrium” of analysis of supply and demand in a single product or factor market.\(^{50}\) The general equilibrium established through market competition was not only shown to be possible—the use of fixed point theorems developed in the early twentieth-century mathematics allowed for a formal proof of the possibility of a set of equilibrium prices under particular conditions—but it was further shown to be “optimal” in the sense that Italian economist Vilfredo Pareto had defined optimality.\(^{51}\) The normative framework that stood behind this optimality theory was marginalist in its assumption of equilibration in markets and the use of corresponding techniques of differential calculus; welfarist in assuming the relevant good to be maximized was social welfare; ordinalist in assuming that welfare consisted in the satisfaction of individual preferences that could be rank-ordered; and noncomparabilist in assuming that these satisfactions were not summable across individuals in a cardinal fashion, as in earlier utilitarianism or the earlier welfare economics of Alfred Marshall or Arthur Pigou. In its conjunction of welfarism, ordinalism, and noncomparability of utilities, this new economics reflected what Amartya Sen calls “the favourable properties” of the mainstream of the economics profession today.\(^{52}\)

Each of these commitments was the product of longstanding debates over methodological and normative questions being settled in one fashion rather than another, a history I cannot here examine for reasons of space. But as should be evident, prioritizing marginalist methods meant foregrounding some questions, such as the dynamics of market equilibration, rather than others, such as the initial determination of the entitlement structure. Likewise, the efficiency criterion of the new welfare economics, “Pareto optimality,”\(^{53}\) offered a theory of ordinal utilitarianism specifying the social good from a welfarist, ordinalist, and noncomparabilist perspective,\(^{54}\) as against rival constructions of the good in

\(^{50}\) See generally GERARD DEBREU, THEORY OF VALUE: AN AXIOMATIC ANALYSIS OF ECONOMIC EQUILIBRIUM (1959).

\(^{51}\) For the advances in topology that enabled this, see Shizuo Kakutani, A Generalization of Brouwer’s Fixed Point Theorem, 8 DUKE MATH J. 457, 457–59 (1941); on Pareto optimality, see infra notes 49, 50.


\(^{53}\) The notion of Pareto superiority can be expressed in different ways but take Sen’s definition as authoritative: “For any two alternatives y and z, y is Pareto preferred to z if and only if it makes at least one individual better off than z and no individual worse off than z.” AMARTYA SEN, COLLECTIVE CHOICE AND SOCIAL WELFARE 21 (1933). The basic idea behind Paretoism is that the social optimum is attained when every person is in a social state which is as desirable as possible without requiring changes that would put anyone else into a less desired position.

\(^{54}\) These distinctions are often elided in the literature. See Sen, supra note 52, at 538 for some useful definitions. See also Sen, supra note 52, at 546 for a discussion of ordinal comparability in the case of lexicographic preferences. Note that ordinalism is not identical with noncomparability, even though the
classical political economy, Marxism, the old welfare economics, and other
branches of political economy, such as historical institutionalism.

This new and still dominant style of economics reached its analytical apogee
in the combination of the two fundamental theorems of welfare economics
alongside a long-sought proof of the existence of general equilibrium in the
competitive market system. The welfare theorems relied on Paretian concepts in
showing that the competitive market system—and, arguably, any system that
could be structured in a parallel fashion, including possibly though central
planning—generated Pareto-optimal allocations. The import of these welfare
theorems was and continues to be much debated, including among legal
academics—but the combination of the new welfare economics and the advent
of general equilibrium theory provided answers to the two fundamental questions
about commercial society—that is: how can it be stable? and why is it good?—in
new terms appropriate to what Samuelson dubbed “the queen of the social
sciences.”

Nothing did more to contribute to that royal title than the advent of general
equilibrium theory. Separately and together, economists Kenneth Arrow and
Gerard Debreu—as well as Lionel McKenzie and several others—specified the
theoretical conditions under which a “general equilibrium” in the economy—the
equilibration of supply and demand for all inputs and outputs through a system
of prices—could be attained. Nineteenth-century economists, most famously
Leon Walras, had sought such a proof but lacked the mathematics of fixed-point
theorems—developed only in the early twentieth century—on which Arrow and
Debreu would rely in their axiomatic model. In significant respects, the Arrow-
Debreu model can be understood as the generalization of the kind of two-person,
two-good model without production that Francis Edgeworth earlier formalized
to cover an indefinite number of agents producing and purchasing commodities,
including futures contracts for all commodities, covering all contingencies.
While criticized for its remoteness from actual economic conditions, the Arrow-
Debreu model nevertheless proved extremely compelling to mid-century
neoclassical economics, both because of its intrinsic analytical attractions—the
model was frequently described as “beautiful,” “elegant,” and so on—and,

early ordinalists may have thought it was. It should also be noted that ordinalism made all utility data
“subjective,” either self-reported or else “revealed” in market choices.

55. See generally CALABRESI, supra note 23; SEN, supra note 52.
57. Kenneth J. Arrow & Gerard Debreu, Existence of an Equilibrium for a Competitive Economy,
22(3) ECONOMETRICA 265 (1954); Lionel W. McKenzie, On Equilibrium in Graham’s Model of World
Trade and Other Competitive Systems, 22(2) ECONOMETRICA 147 (1954).
58. See generally Kakutani, supra note 51; LEON WALRAS, ELEMENTS OF PURE ECONOMICS (1874).
59. FRANCIS EDGEWORTH, MATHEMATICAL PSYCHICS: AN ESSAY ON THE APPLICATION OF
MATHEMATICS TO THE MORAL SCIENCES (1881).
60. For a characteristic assessment, see DOUGLAS GALE, STRATEGIC FOUNDATIONS OF GENERAL
relatedly, because, as reported by one economist over half a century later, “it remains the best rationalization we have of the viability of the market system.”

The achievement of general equilibrium theory did more than anything else to win economics its twentieth-century reputation as the first and only real science among the social sciences—and the model for the rest. In terms of legal scholarship, the influence of the new welfare economics and associated general equilibrium theory was tremendous. It is against this conceptual backdrop that we must situate the rise of contemporary law and economics, in addition to the history of more contingent sociological and ideological factors, as explored at length elsewhere. Put simply, owing to the power of general equilibrium theory, no other social-scientific discipline matched the prestige of economics during these crucial mid-century decades. Nor should the significance of that theory in providing the “best rationalization we have” of the virtues of the competitive market system be underestimated, as recent historical studies of the rise of law-and-economics as part of the “conservative legal movement” have made clear.

But my focus presently is not the sociology of knowledge or ideological conflict in the academy, but instead a conceptual history, tracking how the elaboration of a formal model of the economy shown to be optimal under particular conditions was incorporated into legal scholarship using auxiliary theories.

B. The Auxiliaries of Equilibrium Analysis

In an earlier article, several co-authors and I described three “linking theories” that played this auxiliary role—externalities, transaction costs, and wealth-maximization—though it would be a mistake to see these as distinct and coherent concepts that entail or require different theoretical specifications. Rather, these theories flow into one another: a theory of externalities and a theory of transaction costs prove mutually supporting, while they together suggest a normative framing, such as wealth-maximization or Kaldor-Hicks efficiency (the possible distinctions between these definitions irrelevant to my purpose here). As my co-authors and I discussed in that earlier article, drawing

formalization of Smith’s insight.”). Roy Weintraub provides an amusing reconstruction of the debate over general equilibrium theory’s utility in a “classroom interlude.” See E. ROY WEINTRAUB, GENERAL EQUILIBRIUM ANALYSIS: STUDIES IN APPRAISAL (1993).

61. GALE, supra note 60, at 204.

62. For example, Bank of Sweden in 1968, when endowing the “Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel” (as above, called the “Nobel Prize in Economics”) cited progress in economic science to justify the prize, with the proof of the possibility of general equilibrium central to the assessment.

63. See Britton-Purdy, supra note 12. I am not here distinguishing rigorously between “law and economics” and the “economic analysis of law,” as Guido Calabresi rightly suggests we do. See Guido Calabresi, The Future of Law and Economics 13–16 (2016). That said, it seems to me that the critique and reconstruction of transaction cost economics should prove relevant to both approaches.


65. See Britton-Purdy, supra note 12.
on the philosophy and history of science, a linking theory serves as a bridge from
the formal conception of the economy that general equilibrium theory
expounded abstractly to concrete questions of legal organization and legitimacy.
General equilibrium theory advanced a conception of the competitive market as
a universal domain of voluntary exchange in which a price-system allowed for the
interdependent equilibration of all individual valuations. This equilibration could
moreover be understood as optimal according to what was seen as a minimal—
and thus allegedly unobjectionable—account of the social good, which upheld
individual self-assessments and thus seemed to avoid arbitrary coercion. The
obvious gaps between this model and reality were of course widely noted from
its inception, but the influence of the model nevertheless invited the effort to
rationalize even non-ideal and non-market institutions on its terms. Overall, what
these auxiliary theories accomplish is the transposition of legal and institutional
questions from the traditional language of coercion and its justification into a new
language of cost, where cost appears as a determinant of rational individual
decision-making. This transposition deprioritizes and displaces long-standing
questions concerning the justification of coercion in the law in order to
foreground a different set of analytical problems.

1. Externalities as The Market’s “Outside”

As noted earlier, the first and, in many ways, foundational auxiliary theory to
general equilibrium is that of externalities or external costs. Yet the concept has
proven difficult to define precisely. In summarizing his survey of the varied
historical uses of the term, Andreas Papandreou concludes that “[e]xternality has
proven to be a poor and misleading classificatory principle.” 66 Perhaps the
earliest formal definition of externalities can be found in Alfred Marshall’s
analysis of how industry structure affects firm performance, where external costs
were elaborated as a kind of unpriced interdependence of firms in an industry
given particular scale dynamics. 67 From that analysis, and then following the rise
of general equilibrium theory, the more familiar discourse of externality took off
in the 1960s and 1970s.

Papandreou identifies two general ways that “external” is now used in the
economic literature, corresponding to two different concerns that motivate the
diagnosis. 68 First, external is used to describe a situation in which some relevant
activity occurs outside the unit of account, whether in a household, firm,
organization, or some aggregate of these—or even in the economic system
altogether. First, external corresponds to a background diagnosis of a problem of
interdependence—for example, when a beekeeper’s bees feed on and pollinate a
farmer’s crops, but that farmer does not pay for the bees’ contribution to his
production. Second, external is used to describe an activity that is inefficient with

67. PAPANDREOU, supra note 66, at 197; ALFRED MARSHALL, PRINCIPLES OF ECONOMICS (1890).
68. PAPANDREOU, supra note 66, at 169–71.
respect to some specified objective function, such as Pareto optimality. This second meaning corresponds to a background diagnosis of a problem of inefficiency—for example, when water pollution from a factory affects downstream users who have no control over the upstream owner’s decisions.

These two meanings may coincide—and are often used in an overlapping way in the literature—but neither strictly entails the other, and they have different fundamental diagnoses and theoretical elaborations. In both cases, however, the puzzle remains how actual institutions relate to the diagnosed problem, whether of interdependence or of inefficiency. Accordingly, externality is often treated as a problem of market failure. This can result from a failure within a particular market to make some costs internal to the relevant agent or set of agents, or to the absence of a market altogether. However, how market failures of either kind arise remains underspecified, lacking clear correspondence to either of the two fundamental diagnoses concerning the problem of externality.

As a loose and expansible category, however, the idea of externality does important work in linking law and legal institutions to the perfectly abstracted model of general equilibrium theory. It suggests that a market economy is or should be effectively comprehensive as an allocative mechanism—not simply one institution among many in organizing social distribution, but rather, in effect, the institution. As such, deviations from it can be identified as discrete problems, gaps in the otherwise comprehensive coverage of the market and its underlying regime of property rights. Externality can thus be applied to any costs that are deemed external to some relevant market actor, or to the price-system as a whole, and which therefore present the constitutive “other” to price—since market price and externality are standardly defined as mutually incompatible, excepting the category of “pecuniary externalities,” which are, in fact, fundamental to competitive markets.

What the theory of externality thus enables is the description of non-market dynamics in market or market-compatible terms, with the effect of making the empirical “outside” of the market a theoretical part of its “inside.” As against earlier theories of political economy that understood the market as one allocative institution among others in a complex social whole, there is no real outside to neoclassical general equilibrium theory. Hence, the obvious outsides to the market that law addresses routinely can be redescribed through the theory of externality as always potentially inside: given new market-generating or market-mimicking institutions, usually some new set of private entitlements, the market’s outside can be understood as an unpriced interaction that affects market transaction. The costs of that interaction could then be priced into the market through institutional innovations that extend its logic, as is common in the market design literature. In conjunction with the related concept of transaction costs, discussed further below, what the theory of externality thus entails is the presumption that the market system—with its essentially catallactic (that is, exchange-oriented) and chrematistic (wealth-oriented) features—proves not one among many possible forms of social cohesion and value-determination, but
rather the normal state of affairs. Although now widely taken for granted, this presumption represents a fundamental reversal of the longstanding view of classical political economy that “commercial society” rested on a set of historically elaborated legal and social institutions that came before it—temporally, analytically, and normatively—and which enabled its emergence.

Under this new dispensation, a concern with the constitutive foundations of the market—for example, the role of politics and law in the determination of the initial entitlement structure or in the maintenance of the transaction structure—gives way to a theory of social cohesion modeled on market exchange, now generalized to all interpersonal interactions. The theory of externality allows the non-market sphere to be reimagined—and, in some cases, practically refashioned—as implicitly within the market, even while still outside of it. This theory thereby recapitulates the high-theoretic framing of general equilibrium theory: a comprehensive set of interconnected, competitive markets allows for the interpersonal exchange of perfectly elaborated property rights resulting in individual utility maximization, within constraints determined by the property rights of others. On this view, legal institutions are best conceived as ancillary supports to economic efficiency. Where these terms of social analysis manifestly break down, the auxiliary theory of externality can be summoned to stretch the analysis and save the general orientation. The effect is to redirect attention at precisely those junctures where a different form of analysis—that is, non-catallactic and non-chrematistic analysis—might be most obviously indicated, thus preserving the fundamental framing of individual utility-maximization within a market or market-like setting. The problems of political will-formation, social distribution, and generalized but unpriceable interdependence are thus sidelined, or else subsumed within the project of extending a vision of private ordering, rather than recognized as the prompt to collective scrutiny of institutional purposes, including that of the market and its relation to non-market distributive mechanisms.

2. Transaction Costs as the Market’s “Friction”

More briefly, the second auxiliary theory is that of transaction costs, which I have already discussed at length above, and which comes in second position here because the concept developed in subtle and direct respects from within reflection on the slightly earlier category of externality. Again, the fact that there is a “cost to using the market mechanism,” as Coase put it, was observed well before his early twentieth-century work, but not formalized into a distinct concept. Only since the mid-twentieth century has this idea been put to use in explaining institutional and legal variation, and it was so deployed with express recognition of the inherent and widely recognized limitations of Arrow-Debreu

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69. See COASE, supra note 28; COASE, supra note 18; COASE, supra note 17; ARTHUR C. PIGOU, THE ECONOMICS OF WELFARE (1920).
70. COASE, supra note 17.
general equilibrium analysis to account for non-market institutions, including command hierarchies that exist alongside or within market institutions.\footnote{1} Transaction costs were first used to rationalize the otherwise puzzling existence of private firms operating alongside markets as an efficient substitute of corporate command for open contracting whenever the costs of market transaction were high.\footnote{2} This same logic was then extended to rationalize all forms of command coexisting alongside contract as the choice among institutional mechanisms given different costs of organization or governance. In this broader dispensation, it subsequently became the centerpiece of the modern law and economics movement in the American legal academy, with the idea of transaction costs functioning to bridge the gaps between neoclassical economic theory and its application to problems of private law and beyond.\footnote{3}

As with externality, the concept of transaction costs offers an underdetermined and extensible theory that serves to rationalize non-market institutions as continuous with or predicated on the logic of the market—that is, susceptible of redescription as individual utility-maximization within constraints imposed by costs, including now the differential costs of organization. What could, under an alternate theoretical dispensation, have seemed to undermine the ideal of the comprehensive market—namely, that so much relevant economic activity occurs outside it—returns, at a different register, to confirm its core logic. Where markets are absent or otherwise imperfect, these failings reflect costs that are nevertheless reckoned in a kind of meta-market of institutions, where the economic logic of cost-minimization continues unaltered even as it is extended beyond any actual price-mechanism. The idea of transaction costs and the idea of externality are thus intimately linked: some costs remain external to competitive markets because the markets that would serve to internalize them are deemed “missing,” even while these markets are deemed missing owing to high transaction costs.\footnote{4}

\footnote{1} For general equilibrium analysis, see Arrow and Debreu, \textit{supra} note 57. Note that the concept of “transaction costs” now functions much like the older concept of an enabling economic “surplus,” which was alleged to be the cause of institutional variation in economic history. Pearson (1957b: 326) complained: “These means [surplus means] become a kind of ‘free-wheeling’ entity which may then be called upon to explain any development from trade to shamanism according to the predilections of the investigator,” \textit{see generally}, Harry W. Pearson, \textit{The Economy Has No Surplus, in TRADE AND MARKET IN THE EARLY EMPIRES: ECONOMIES IN HISTORY AND THEORY} (Karl Polanyi, Conrad M. Arensberg & Harry W. Pearson eds., 1957).

\footnote{2} \textit{COASE, supra} note 17.

\footnote{3} \textit{COASE, supra} note 18.

\footnote{4} On the use of incomplete or “missing” markets in the justification of legal doctrine, see, for example, Keith N. Hylton, \textit{Missing Markets Theory of Tort Law}, 90 NW. U. L. REV. 977, 978 (“tort doctrine should be viewed as a response to the incompleteness of markets, or more generally the problem of missing markets.”) An alternative to the idea of “missing markets”—which would seem to presuppose a comprehensive catallactic and chrematistic social order—would be to understand externality as a feature of institutional interdependence, perhaps requiring institutional enhancements, though not necessarily of a standard market variety. For further discussion of the conceptual difficulties involved, see generally \textit{PAPANDREOU, supra} note 66.
As argued in Part I above, it makes little sense with such an underdetermined and expansible category—whether transaction costs or externality—to ask what these costs are, as if such varied conceptual uses pointed to some underlying social fact, rather than a series of orientations and approaches to puzzles generated serially and without necessary logical consistency or empirical promptings. At the level of narrative description, however, it is straightforward to observe that externality is doing the work of rationalizing the market’s “outside”—that is, the non-market institutions that complement and substitute for priced activity—while transaction cost is doing the work of rationalizing the market’s “friction”—that is, conflict within markets and beyond them over commodity relations. What would otherwise be understood as the limits to the market as an institution or else as problems with the market’s concrete functioning—including from contestation over property rights and the indeterminacy of contract—are thus redescribed as (1) an outside that is dialectically related to the market’s inside in a way that confirms the latter’s centrality and comprehensiveness; and (2) the friction that general equilibrium theory had precluded, now recast not as challenging the idealized conception of the market as a comprehensive allocative mechanism but as rationalizing non-market institutions in a market framework.

IV

CONCLUSION: WEALTH AS THE MARKET’S VALUE

This vision of the market as an imaginary but comprehensive allocative mechanism—a “generalized way of thinking about interaction”75—seems to presuppose and reinforce a normative framework that privileges market exchange as the criterion of the good. While economic high theory relied on the refined, if abstract, criterion of Pareto optimality, the legal academy after Coase tended to use the cruder theory of “wealth-maximization” in its assessments of the good. In our earlier article, my co-authors and I identified wealth-maximization as a third linking theory connecting the institution-less abstraction of general equilibrium theory to law.76 On that argument, wealth-maximization provided a crucial link between the unworkable but allegedly unobjectionable standard of Pareto optimality, as used in the normative assessment of Arrow-Debreu general equilibrium theory, and the kinds of problems that routinely arise in legal and policy analysis, in a way that prioritized market or market-mimicking processes.

I now think that a better way of putting the matter is to understand wealth-maximization as one among several related optimality or efficiency criteria prompted by the adoption of transaction costs and external costs as auxiliary theories, a sort of derivative normative framing that these linking theories bring with them implicitly or explicitly. So long as difficulties arising from outside or

75. Auer et al., supra note 4, at iv.
76. See Britton-Purdy, supra note 12.
through the use of the market mechanism are understood as “costs,” these auxiliary theories allow the lawyer-economist to presuppose a conjoint optimization strategy for both market activity and unpriced, non-market activity. There is no reason to be fussy about where costs occur if they can be minimized as part of achieving the lowest total cost for a desired end. The result is the expansion of a market ideal—not, as would seem apparent on the surface, a criticism of the market for its apparent imperfections—which manifests crucially, if not exclusively, in the normative framing that justifies that ideal.

In this respect, a catallactic and chrematistic evaluative framework would seem at least strongly suggested, if not strictly theoretically entailed by the adoption of externalities and transaction costs as auxiliary theories of general equilibrium analysis. It might be simplest to call this framework “exchange-value maximization,” with the caveat that this value may often be reckoned merely hypothetically, as if exchange had occurred, as in hedonic pricing methods and related efforts to utilize “willingness to pay” estimates of demand in non-market contexts. Regardless of how it is precisely elaborated—whether as Kaldor-Hicks or potential Pareto optimality, wealth-maximization, individual preference-satisfaction, or the maximization of “the value of production,” as Coase himself described the “economic problem”—the use of auxiliary theories to general equilibrium depends on and reinforces an account of the value of exchange as the market’s internal normative logic. That logic is then transferred via these auxiliaries beyond the market’s actual institutional realization to a kind of spectral market, which exists at most in potentia and sometimes merely ex hypothesi, a conceptualization of society presupposed by the neoclassical conception of the agent as an individual optimizer of given ends with scarce means, as Lionel Robbins famously put it.

As an historical matter, it is worth observing that on an “objective” theory of exchange value—most famously, David Ricardo’s labor theory of value, but also any of several others—the market’s internal logic was understood as an objective feature of commodities or quasi-commodities, identifiable even outside formal market settings, as in production processes subject to command hierarchies. In effect, it was this theoretical presupposition that secured a conception of “the economy,” from François Quesnay’s Tableau économique, in which grain circulated as value, through to pre-marginalist classical political economy of the nineteenth century, especially those strands that emphasized the labor theory of value. But given the subjective turn in post-marginalist economics, the reassertion of the logic of exchange-value maximization in settings that are outside formal exchange has required a more complex structure of argumentation, including the use of the auxiliary theories discussed in this article to extend the reach of Arrow-Debreu general equilibrium theory.

77. Coase, supra note 17 at 15.
However conceived, these accounts of economic optimality solve the normative problem of providing a ranking of social states, but only by reconfiguring the agent and its ends so as to normalize private orderings as against collective purpose at precisely those points where we see a conflict of values at a collective level not susceptible to rationalization as the mere exchange of reciprocal utilities. By tying social assessment to market transaction in this manner, especially to a hypothetical, even hypostatized market, these theories of exchange-value maximization as the market’s logic operate to reassert its comprehensive social role. Again, the “market” in this imaginary is not simply an institutional mechanism allowing for commercial exchange, but rather a spectral institution that stands in the abstract for all social choice under this dispensation. Its specific ontology seems to emerge once non-market institutions have been rationalized as market-like through these auxiliary theories.

Exchange-value maximization thus works with the two auxiliary theories described above, and in a mutually reinforcing way, to recenter the logic of the market precisely where an ordinary observer might not see a market at all—for example, in family life, criminal activity and its control, political decision-making, legal justification, and so on. One effect of this maneuver on longstanding questions of jurisprudence has been the transposition of the justification of coercion—perhaps the central problem in modern law—to a problem of cost-minimization, as becomes explicit in a variety of contemporary applications of law and economics to the criminal law. But the point stands beyond criminal sanctions and goes to the heart of the justification of law more generally.

In the terms of normative analysis, what these auxiliary theories enable is the recasting of a multidimensional conflict of values into an apparently soluble unidimensional problem of value-maximization. In the economic abstraction of commodity space, we are accustomed to accepting the fiction that a “numeraire”—money—enables the commensuration of values. Indeed, the commodity theories of money elaborated since Aristotle’s *Nicomachean Ethics*, 5.5 (discussed in Rachel Friedman’s contribution to this volume) and pursued with vigor since the eighteenth century have led to a widespread theoretical complacency about just what that numeraire is, or could be, such that it could accomplish that normative task—that is, the reduction of a multidimensional conflict of values to a unidimensional problem of optimization. But even where


80. On the most recent iteration of this market expansionism, see Peter Spiegler, *The Unbearable Lightness of the Economics-Made-Fun Genre* 19 J. ECON. METHODOLOGY 283 (2012).


82. Rachel Friedman, *Aristotle on Reciprocity, Equivalent Value, and the Embeddedness of Markets*, 86 LAW & CONTEMP. PROBS., no. 4, 2024, at 1, 2.

83. See Roy Kreitner, *Concepts, Contexts, Contexts*, 86 LAW & CONTEMP. PROBS., no. 4, 2024, at 147;
money is not actually present—that is, where we are not in a formal market setting, as we are not, say, when litigants meet in a court—auxiliary theories work to support the presumption that all values can, at some indefinite higher level, be commensurated. The result is that exchange-value maximization can be presupposed as a comprehensive social logic. Through these epicycles of general equilibrium theory, the moral and often political problem of a plurality of conflicting values is thus rendered an economic problem of optimization. Commerce substitutes for political decision-making, which settles—even if it does not solve—the problem of conflicts of values through the construction of a collective ordering in which some aims are prioritized over others. But no such collective ordering would seem to be required if exchange value serves as a simulacrum of the will, and allows opposing wills to be jointly maximized, as has been argued in discussions of value since the eighteenth century.84

To shed light on why modern jurisprudence has been so susceptible to what would otherwise seem an incompatible style of normative argumentation, we should perhaps give the final word on this subtle problem to the ancient Egyptian goddess Ma’at. As the embodiment of harmony, justice, law, morality, and cosmic order—these desiderata all a single, indistinct concept called ma’at—the goddess Ma’at was particularly responsible for weighing the heart of the dead against an ostrich feather to judge the goodness of the life that had ended and determine its fate in the afterlife. She appears in ancient iconography wearing an ostrich feather and holding scales.85

The Weighing of the Heart is one of the most consequential and misleading theological metaphors in the history of political and moral thought, joined by the arguably parallel Stoic conceit of an “invisible hand” of God ordering the cosmos, which I have examined elsewhere.86 The metaphor presupposes a single, divinely operated scale that can make all the acts of a life sortable into good and bad, rendering them commensurable with each other—and weighable against the ostrich feather. Thus was the difficulty of the multidimensional evaluation of a life reduced mechanically, via a divine instrument, to a problem of what we might call ma’at-maximization.

This theological conceit was not restricted to Egypt but spread following its


84. As Abba Lerner put it, “[a]n economic transaction is a solved political problem. Economics has gained the title of queen of the social sciences by choosing solved political problems as its domain.” See Abbe Lerner, The Economics and Politics of Consumer Sovereignty, 62 AM. ECON. REV. 258, 259 (1972).


conquest by Rome, after which Ma'at became more familiar as the Roman goddess Justitia or Lady Justice. Justitia has appeared in courthouses since antiquity and was globalized, along with the legal systems of modern Europe, so that she can now be seen around the world.\textsuperscript{87} Ma'at operated initially through the discourse of ius, awkwardly translated “right” or “law,” which became central to the legitimation of the expanding Roman empire, promising a kind of legal equality among free subjects as a proxy or substitute for the political equality of shared citizenship.\textsuperscript{88} Since that time, and down to the present day, the goddess Justitia has appeared in iconography as a blindfolded woman holding a pair of scales.\textsuperscript{89} The blindfold restricts the divinity from judging a legal conflict on any grounds other than the differential weights that appear to her on the scales of justice. These magical scales render good and bad as homogenous, cardinal qualities, reducing a multidimensional problem of evaluation to one of unbiased measurement, thus allowing for proper dispute resolution on the model of weighing the hearts of the dead.

Borrowing later terminology from the physical sciences, what the scales of justice presuppose is “dimensional homogeneity” in ethical analysis, meaning that activities in a life – or a courtroom – amount to the same kind of thing, differing only in measurable quantities, not essential qualities.\textsuperscript{90} Putting aside the disembodied hearts and ostrich feathers, and coming to the present day, the scales of justice seem primed for the fictional numeraire of “money” – a homogenous, abstract substance both representing value and making it real, which can be weighed with precision on both sides, as scales are designed to do. Recall Karl Marx’s description of money as “the absolutely alienable commodity, because it is all other commodities divested of their shape.”\textsuperscript{91} However, positioning one metaphor (the scales of justice) in relation to another (money as a shapeless commodity) does little to resolve the question as to why modern law should be so susceptible to this abstraction. But the metaphoric congruence does suggest why a different set of metaphors—the market’s friction, the market’s

\textsuperscript{87} Dennis Curtis & Judith Resnik, Representing Justice: Invention, Controversy, and Rights in City-States and Democratic Courtrooms (1986); see also Dennis Curtis & Judith Resnik, Images of Justice, 96 Yale L.J. 1727 (1987).


\textsuperscript{89} Jacques De Ville, Mythology and the Images of Justice, 23(3) L. & Lit. 324, 324–64 (2011); Wendy Sutherland-Smith, Justice unmasked: A semiotic analysis of Justitia, Semiotica 213–22 (2011).

\textsuperscript{90} For a definition of “dimensional homogeneity” in the physical sciences, see Alberto N. Conejo, Units, dimensions and dimensional homogeneity, 13 Fundamentals of Dimensional Analysis: Theory and Applications in Metallurgy 25 (2021) (“The principle of dimensional homogeneity is based on the fact that dimensions and units in every term of one equation have to be the same in order to obey the equality. If this condition is satisfied the equation is dimensionally homogeneous.”).

\textsuperscript{91} Marx, Capital, Vol. 1, p. 205.
outside—operating as the auxiliaries of general equilibrium theory have had so strange and successful a career.