

Review of Mariusz Maziarz's *The Philosophy of Causality in Economics: Causal Inferences and Policy Proposals*. New York: Routledge, 2020, xiv + 208 pp.

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It is common to find causal statements in economics journals. In a recent article, for example, Babina et al. claim that “negative federal funding shocks *reduce* high-tech entrepreneurship and publications but *increase* patenting” (2023, 1). Unfortunately, the actual meaning of ‘cause’ is not always explicitly spelled out. What does ‘cause’ mean in these statements? Do they connote the same meaning? More concretely, what do economists mean when they say *X* causes *Y*? These questions motivate Mariusz Maziarz’s intriguing book on causality. Based on a previous systematic literature analysis,¹ Maziarz explores different research methods that economists use to advance causal claims. This allows him to show how different research methods implicitly endorse one of the main five philosophical accounts of causality: (1) the regularity approach, (2) the probabilistic approach, (3) the counterfactual approach, (4) the mechanistic approach, and (5) the manipulationist approach. In following his analysis, he claims: Economists are moderate causal pluralists.² The methods they use to support causal claims reveal distinct relations that are consistent with different philosophical definitions of causality.

It is important to note that Maziarz’s study remains agnostic on what causality is for economists as an ontological stance. He focuses on an epistemological description and aims to disentangle what kind of evidence economists use to infer causal relations. Maziarz’s analysis does not stop here, though. The epistemological descriptive analysis allows him to advance some normative claims about policymaking as well. He focuses on how policymakers ought to use causal evidence, and contends

¹ Maziarz’s methodical review identified papers asserting causal conclusions. The sample includes articles published between 2005 and 2015 in the three top economics journals: the *American Economic Review*, *The Quarterly Journal of Economics*, and the *Journal of Political Economy* (see the database in Maziarz 2018).

² Maziarz labels his position as moderate in order to differentiate it from radical pluralism. The latter argues that each use of causal language carries an underlying different meaning of causality (see 201, footnote 1).

that different causal claims have different policy implications. In particular, he claims that policymakers should not use causal evidence that implicitly endorses a certain philosophical view to recommend policies that require a different account of causality. For example, a causal claim based on evidence assuming the regularity view of causation should not be used to justify a policy requiring a manipulationist approach. Otherwise, the intervention might result in unforeseen policy outcomes. Maziarz accompanies the discussion with a clear and succinct explanation of the type of policy the research methods can promote.

Maziarz describes in chapter 1 the framework he employs for studying economists' causal claims. He analyzes these claims through the lens of referential semantics, which posits that the meaning of words and sentences is derived from their referents (i.e., the objects they refer to). Since the economy is only accessible via research methods, Maziarz considers these methods as the objects the causal claims refer to. In other words, Maziarz identifies the meaning of causal claims with the causal relations the research method can reveal. For example, if an economist conducts an experiment to see the effects of X on Y , and claims that X causes Y , the causal claim indicates the realization of the experiment. Maziarz breaks down the epistemic concept of causation that can be uncovered by the method and aligns it to one definition of causality in the philosophical literature.

From chapter 2 to chapter 6, Maziarz devotes each chapter to one of the five main philosophical views of causation. He follows a clear and well-organized structure. First, Maziarz introduces the respective philosophical approach and its reception in economics; he then follows a discussion on economic research methods that implicitly endorse the corresponding philosophical view. This is accompanied by examples from published papers in top economic journals. Lastly, Maziarz explores the policy implications that follow from the philosophical approach to causality. Chapter 7 serves as a conclusion for the entire book and recapitulates the main argument. Due to this structure, the chapters appear to be self-contained, allowing interested readers to easily delve into any chapter without necessarily having to read the ones preceding it.

In general, his descriptive claim about causal pluralism and his normative claim about how evidence should be used for policymaking are articulated as follows.

Maziarz maps economists' research methods to philosophical approaches on causality in order to demonstrate their causal pluralism. The

regularity account suggests that empirical regularities, or constant event conjunctions, are indications of causal relations. Maziarz argues that this is implicit in theory-driven econometrics and data-driven cliometrics methods. The *probabilistic view* holds that causes increase the likelihood of effects. In this case, Maziarz contends that economists implicitly assume this view when using atheoretical econometric methods and when they differentiate cause from effect based on time precedence. This is the case, for example, when economists use vector autoregression models (VAR) to advance causal claims based on Granger causality tests.³

The *mechanistic view* on causality is implicit in theoretical models without empirical support and DSGE models. In particular, Maziarz asserts that economists implicitly accept the mechanistic view in accordance with the New Mechanistic philosophy and Marchionni's (2017) definition of economic mechanisms: the causal claim is produced by the interaction of entities. Finally, the *manipulationist view* of causality is implicit in experimental and quasi-experimental methods. By analyzing Instrumental Variables (IV), Regression Discontinuity Designs (RDD), randomized experiments and laboratory experiments, Maziarz argues that these methods are exemplary of Menzies and Price's (1993) manipulationist approach in which human interventions raise the probability of certain effects materializing.

Maziarz argues that methods not based on the manipulationist view fail to guarantee a casual relation to be invariant under intervention. They do not necessitate that an intervention will bring about the effect. Data-driven methods assuming a regularity or probabilistic account can result from common-cause fallacies: The founded causal relation can be the result of a third variable causing both. With regards to theory-based methods which implicitly assume the regularity account, Maziarz argues that an intervention might change the causal structure previously assumed by the theory, even if the theory correctly depicted it. His argument is based on differentiating causal structures with and without interventions. Since they differ, a founded casual relation based on the latter cannot guarantee an effect on the former.

Regarding mechanistic evidence, he claims that this kind of evidence is unable to assure invariance because most models represent single mechanisms. In the economy, several mechanisms operate at the same time. The problem with the counterfactual account is that these two kinds

³ X_t Granger-causes Y_{t+1} if $P(Y_{t+1} | \Omega, X_t) \neq P(Y_{t+1} | \Omega)$, where Ω represent a vector of recent and lagged relevant variables.

of research methods can only establish token-level causal claims and thus their results cannot be extrapolated to guide type-level policy implications. Doing so would require additional knowledge.

Maziarz is not pessimistic, though. He claims that casual evidence not demonstrating invariance is still useful and can justify certain kinds of policies. On the one hand, studies presupposing probabilistic or regularity views on causality are sufficient for policies that do not modify the relata of causal claims (the cause). Policymakers should only use this kind of evidence to implement policy if the action does not interfere with the causal structure producing the phenomena of interest. On the other hand, studies assuming a mechanistic view can justify institutional reforms. This kind of policy aims at promoting certain kinds of mechanisms previously represented in economic models. Institutional reforms modify factors that shape preferences and decisions of economic agents, aiming to promote the emergence of mechanisms represented by models.

Even though Maziarz posits that methods presupposing the manipulationist view as the only way to assert invariance, he emphasizes the extrapolation problem. The causal claim is true only for the sample of the population under study, it does not guarantee the same effect on the target. Thus, Maziarz demands to make sure that a certain level of similarity exists between the sample population and the population target. This can be accomplished by means of pilot policies or pilot interventions on the target.

In brief, this book guides the reader through the philosophical literature of causality and explores how some economic methods presuppose different views of it. By doing this, the author also provides some normative assertions on how policymakers should use causal evidence. While I think that Maziarz's arguments are valuable, I could not ignore some inaccuracies in how economists approach causal inference. I focus on a few of them.

Marziarz describes regression methods and correlation as being similar because they are symmetrical, and thus they cannot establish causal direction on their own (see 18, 71, 73 and 167).⁴ While it is true that regression itself does not allow the economist to infer the causal direction

⁴ Marziarz appears to be using regression coefficients and partial correlation coefficients interchangeably. For example, he refers to Mian and Sufi (2012) regression coefficients as partial correlations (95). They are not necessarily equivalent.

of two variables, a shared symmetrical characteristic with correlation coefficients does not correctly describe the problem of establishing causal direction.

Correlation and partial correlation coefficients are indeed symmetric. They are symmetric in the sense that it does not matter whether you calculated it between y and x or between x and y . Either way, you will get the same result. Regression coefficients, on the other hand, are not a symmetrical relation in this sense. The regression coefficient of y on x , does not equal the regression coefficient of x on y . They do not even equal their respective algebraic inverse. Regression implicitly assumes causal direction from the right-hand to the left-hand side of the equation (Hoover 2008, 2012). It is true that there is a relation between regression coefficients and correlation. In a simple two variables case, for instance, they represent different normalisations of the correlations between the variables, but this does not mean they are symmetric.

The problem for inferring causal direction with regression can be illustrated by a simulation example inspired by Hoover (2001, 194). Figure 1 shows a figure in which data was generated as x being a cause of y . Two regression lines are marked. One of y on x and another of x on y . As previously argued, it can be seen how they are not symmetric in the same sense as correlation. What is unfortunate, however, is that nothing tells us which one of these two regression lines should be preferred. They are observationally equivalent. Given that in the real world, we do not know the real casual structure (i.e., the data generating process) as data can support two different casual structures. Regression alone cannot solve this problem. The problem arises because it is a statistical method. And as a statistical method, it cannot differentiate the conditional distributions of the variables. There is nothing in the joint statistical properties of x and y to tell us that the former causes the latter or vice versa. For this, we need causal assumptions: assumptions about the true data generating process.

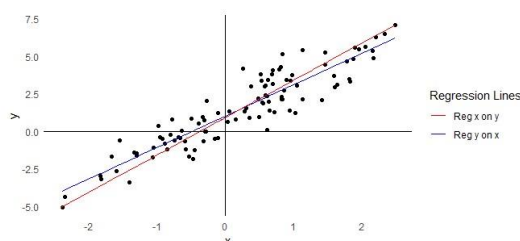


Figure 1: The problem of observational equivalence

One way to deal with the needed causal assumptions is through the *potential outcomes framework*.⁵ In a nutshell, the potential outcomes framework, closely developed as part of randomized experiments, sees the problem of causal inference as a comparison between two potential outcomes: the outcome if individual i is treated, Y_i^T , and the outcome if individual i is not treated, Y_i^C . Unfortunately, Maziarz does not provide an accurate representation of this approach.

Maziarz contrasts economics with epidemiology, and asserts that counterfactual causality is part of the latter but not part of the former because epidemiology uses the potential outcomes framework (88). This assertion is not accurate. A significant part of economic research leans on the potential outcome framework. The Nobel Prize in Economics in 2021 recognized Guido Imbens and Joshua D. Angrist for their efforts in introducing this framework into economics (see Angrist 2022; Imbens 2022).⁶ Their work, in some sense, shaped how economists think about research designs and the type of causal relations they can uncover. A clear example of this is Doyle's (2007) instrumental variable (IV) paper which Maziarz discusses in chapter 6. In this paper, the author explicitly references Angrist, Imbens, and Rubin (1996) and Imbens and Angrist (1994) when discussing his empirical strategy. Both papers demonstrate how the IV method can be interpreted within the potential outcome framework. It is unclear why Maziarz neglects the potential outcome framework as an important part of economic research.

Maziarz not only minimizes the impact of the potential outcomes framework in economics but also misrepresents it. He analyzes Mian and Sufi (2012) and claims that the study is based on the potential outcomes approach (88, 96). There is no use of formal potential outcomes notation in the paper and so it should not be taken as an example of this framework.

In summary, Maziarz's book does an excellent job by emphasizing the causal pluralism that is part of economics research. The analysis is also valuable because he studies the implications on policymaking. Nevertheless, if philosophers take this book as a first approach to causal inference

⁵ The potential outcomes framework is also discussed in the literature as the Rubin Causal Model (e.g. in Weinberger 2002) or the Neyman-Rubin Framework (e.g. in Heckman and Pinto 2022.)

⁶ They shared the prize with David Card for his empirical contributions to labour economics.

in economics, they should carefully evaluate the explanations that are part of the book.

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