

**PHD THESIS SUMMARY:
Methodology and Microfoundations: A New Argument for an
Autonomous Macroeconomics**

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Although microeconomics and macroeconomics differ in their object of study—microeconomics studies how economic individual agents make decisions and how those decisions interact, while macroeconomics studies the fluctuations of the economy as a whole—there is a significant tradition in economics that argues that macroeconomic models to be seen as epistemically compelling need to be given *microfoundations*. That is, ‘macro’ aggregates need to be shown to be derivable from the choice patterns of individual economic agents.

This dissertation focuses on arguments that take macroeconomic and microeconomic entities’ respective ontological natures as *the reason* why macroeconomics cannot be fully *microfounded* (Epstein 2014, 2015; Hoover 2001, 2009, 2010, 2015). Since these arguments depend on the metaphysical relationship between macroeconomics and microeconomics and metaphysical arguments tend to be controversial, their conclusions cannot directly be verified empirically. This distracts us from an important question: “how should macroeconomists build models?” The core questions addressed in this dissertation are: (1) To what extent do macroeconomic models require microfoundations? And (2) what grounds the need (or absence) for microfoundations?

Chapter two (published as Ruiz 2021) assesses Brian Epstein’s (2014, 2015) arguments. Epstein argues that the microfoundationalist approach is unconvincing because economists overlook the influence ontological commitments have on scientific practices, specifically ontological individualism (OI). Since OI states that there is nothing more to social phenomena above and beyond facts about individual people, macroeconomic models, in turn, must represent individuals’ choice patterns. For Epstein, wrong ontology entails poor modeling, thus economists must adopt a

form of *social ontology*¹ to improve the foundations of their methodology. Furthermore, Epstein states that OI does not capture macroeconomics' nature and suggests a social ontology in which grounding/anchoring (GA) metaphysical relations will uncover macro-phenomena's nature.² Thus, for a model to accurately represent macroeconomic phenomena, according to Epstein, economists must first establish the GA relations of the modeled object(s).

I argue, instead, that fixing social ontology prior to the process of model construction is optional rather than necessary. I draw attention to Weisberg's (2013) target-directed model account to show that in the process of model-building scientists choose/design target-systems for many different reasons. Representational accuracy—i.e., how well the structure of the model maps the structure of the world—is just one among them. Complete knowledge of all the GA facts of a phenomenon—fixed ontology—is not only what scientists consider when designing target-systems' features to conform with a mathematical structure. Take, for example, Jevons' (1871) development of 'economic man': Jevons reduced Bentham's utility account from seven dimensions to two dimensions to accommodate the demands of the mathematical structures he was working with, thus representing the dimensions of pleasure/pain in a two-dimensional space (Morgan 2006). This shows that what is mathematically tractable is as important for good modeling as accurate representations.

This process of targeted-model construction shows that addressing ontological questions first does not *necessarily* help modelers in the model-building process. Epstein's account, therefore, cannot answer the question about microfoundations because whether macroeconomic models are built based on individual agents' choices (or not) is not solely an ontological question—it is also a methodological one. Macroeconomists have different intentions when designing target-systems; whether or not they are committed to OI is not all that matters to their model-building

¹ Social ontology studies whether macro(economic) phenomena are constituted of exclusively individual agents or something beyond these, i.e., a distinctly social entity.

² *Grounding* is a relation in which lower-level facts—facts about economic agents—are the metaphysical reason for why a set of higher-level facts—facts about macroeconomics—are the case. *Anchoring* is a frame principle in which collective acceptance of a constitutive rule (society's individuals accepting a rule) sets the metaphysical reason why for a set of grounding conditions of a social macro-phenomena are the case (Epstein 2015). For example, the reason why a greenish piece of paper is a United States Dollar (USD) is because of society's collective acceptance of a constitutive rule "being printed by the Bureau of Engraving and Printing (BEP) grounds what is being a USD" anchors the existence of what grounds (being printed by BEP) being a USD.

practices. A better question is: when do microfoundations lead to good modeling practices?

Chapter 3 focuses on one argument found in Kevin Hoover's book *Causality in Macroeconomics*.³ Hoover argues that macroeconomics is a suitable science for a structural causal analysis (SCA), which studies variables as part of "a network of counterfactual relations that maps out the underlying mechanisms through which one thing is used to control or manipulate another" (Hoover 2001, 24). Interestingly, I point out, this is only plausible given Hoover's realist commitments to causality—causes are real properties of a variable in a structure—and to an ontological dichotomy between natural and synthetic macroeconomic aggregates.

Natural aggregates are simple sums or averages. Synthetic aggregates are fabricated out of components whose structure is altered—an independent macro-premise, such as *Indexing*, has been added (Hoover 2001). Synthetic aggregates, therefore, are not fully composed of individual economic agents. If synthetic aggregates cannot legitimately be derivable from the micro-configuration of the economy, microfoundations cannot fully eliminate macroeconomics and macrovariables can be studied in SCA (Hoover 2001). I argue, instead, that Hoover's *ontological* dichotomy is a measurement problem. To measure unemployment, depending on the purpose at hand, it might either be enough to add the number of working-age people failing to get a job or it might be more appealing to use the measurement procedure like the one used in *Natural Rate of Unemployment*, which considers facts about the economy's expected future, changes in labor force, technological progress, changes in labor market institutions, actual wage settings, and changes in government policies (Krugman and Wells 2009). Unemployment rates could be treated as either a natural or a synthetic aggregate. Hoover's methodological approach, therefore, does not get off the ground.

Finally, I shed light on a different approach to macroeconomic modeling. Dani Rodrik's (2015) modeling account makes explicit that to assess/chose a model to work with economists must consider the purpose the model is going to be used for—for instance, predictive accuracy, empirical relevance, explanation, data fitness, internal consistency, policy

³ Hoover has several arguments pointing that macroeconomic models cannot exhaustively derive microfoundations. I focus on this to best assess the import of ontological arguments to methodological practices.

goals, etc. Although it does not completely solve the debate about micro-foundations, it illustrates that the question can be evaluated from a practice-based perspective, instead of for ontological-based reasons.

Chapter 4 further explores the issue of ‘model diversity’ (a term used by Rodrick 2015). In contrast to the accounts of Aydinonat (2018) and Veit (2020, 2021), I argue that economic model *diversity* doesn’t entail model *pluralism*. Using a microfoundationalist example, I illustrate one of the methodological virtues of model diversity not found in model pluralism.

For Aydinonat (2018), models are tools for how-possibly reasoning about economic phenomena that allow economists to think of possible answers to an ‘*explanation-seeking question*’—that is, different *if-then* ways to think of *y*’s or *z*’s relevance in phenomenon *X*. Since there is no single model that can capture all the causal factors of one phenomenon, having many models about phenomenon *X* expands the menu of possible what-if questions/answers. Model diversity, therefore, secures better economic explanations (Aydinonat 2018). Veit (2020, 2021) dubs model pluralism⁴ the practice that for any scientific goal *z* scientists require multiple models of aspect *x* of phenomenon *y*. Contrary to these, I take model diversity to not entail epistemic completeness (for instance, read Morrison 2011), at least not necessarily. Note that in some cases—climate science—multiple models for forecasting purposes are used, but forecasting (and explanation) are not the only scientific goals of a model. Model diversity gives economists the ability to adapt/build on existing models—adjust critical assumptions, parameters, idealizations, de-idealizations, etc.—to best serve the purpose of the model. Following Rodrik, I propose that model diversity’s epistemic virtue is the ability to choose *a* model that best fits *a* chosen purpose: “we have a menu to choose from and need an empirical method for making that choice” (Rodrik 2015, 44).

Consider two models of economic growth, one with and one without microfoundations. Model 1—a version of the Solow model (see, e.g., Jones 2002)—treats technological progress as an exogenous variable that grows at a fixed rate *g*. Model 2—a version of Romer’s endogenous growth model—treats technological progress as the result of intentional investment decisions made by profit-maximizing agents (Romer 1990). For cer-

⁴ Veit identifies four forms of model pluralism—weak, weakly moderate, moderate, and strong. He identifies Rodrik’s and Aydinonat’s account as *weak moderate model pluralism* (Veit 2020, 96). Since I take this version to concur with pluralistic accounts of scientific practices, I refer to all four forms as *model pluralism*.

tain epistemic and practical purposes, Model 1 may be preferable in virtue that it might be easier to understand by the targeted audience (policy makers and voters). That is to say, economists can more easily justify policy interventions that increase the rate of technological progress—increase funding to public universities—to policy makers and the wider public because of Model 1’s explanatory virtues as compared to Model 2. In another context, Model 2 may be preferable because its predictive accuracy allows economists to justify how incentives to private investors have an input in general economic growth. When it comes to model choice (afforded by model diversity), there need not be one right answer: it depends on the context in question.

In sum, the contribution of this dissertation can be stated as follows: by treating the debate over microfoundations as a purely methodological issue, rather than an ontological issue, it is possible to view macroeconomic phenomena as a product of individual economic agents’ decisions, but other times the former must be treated as independent from its microeconomic parts. That is, the debate is in an either/or question.⁵

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⁵ Read also Ruiz & Schulz, forthcoming.

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