Chapter 7

Research Ethics in Economics: What If Economists and Their Subjects Are Not Rational?

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Abstract Economists and their subjects are not always rational. The problem is so significant that economics is not able to satisfy the principal criterion for science that several philosophers of science have formulated since the logical positivists in the Vienna Circle in the 1920s: In order for a theorem to be meaningful, it has to be confirmed by the facts of the world. The increasing frequency of unverified and invalidated theories in economics suggests that economics suffers from the consequences of a questionable research practice in the processes of scientific knowledge production – the practice of refusing to reject theories that are invalidated by hard evidence and counter argumentation.

7.1 Introduction

In response to the observation that the shocks are imaginary, a standard defense invokes Milton Friedman's (1953) methodological assertion from unnamed authority that "the more significant the theory, the more unrealistic the assumptions." More recently, "all models are false" seems to have become the universal hand-wave for dismissing any fact that does not conform to a favorite model. The noncommittal relationship with the truth revealed by these methodological evasions and the "less than totally convinced ..." dismissal of fact goes so far beyond post-modern irony that it deserves its own label. I suggest "post-real." Romer (2016a)

In a well-known article, Thomas Herndon et al. (2013a) replicated two of the papers by Reinhart and Rogoff (2010a, b). In their papers, Reinhart and Rogoff argued that "median growth rates for countries with public debt over roughly 90% of GDP are about 1% lower than otherwise; average (mean) growth rates are several percent lower." Herndon, Ash, and Pollin found that the works of Reinhart and Rogoff featured coding errors (especially where no data were available for some of the European countries), exclusion of data (of Australia, Austria, Belgium, Canada,

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and Denmark), and unconventional summary statistics. They claimed that “selective exclusion of available data, coding errors and inappropriate weighting of summary statistics lead to serious miscalculations that inaccurately represent the relationship between public debt and GDP growth among 20 advanced economies ... when properly calculated, the average real GDP growth rate for countries carrying a public-debt-to-GDP ratio of over 90% is actually 2.2%, not -0.1% as published in Reinhart and Rogoff. That is, contrary to [Reinhart and Rogoff], average GDP growth at public debt/GDP ratios over 90% is not dramatically different than when debt/GDP ratios are lower.” Austerity policies, they concluded, were unnecessary. Papers by Reinhart and Rogoff have been two of the papers frequently referenced by those who argued for the austerity plans in Europe and the US after the 2008 Financial Crisis. In other words, the proposal(s) for the necessity of austerity plans relied on a paper full of errors and miscalculations. Reinhart and Rogoff (2013) responded to their critics in a newspaper article and accepted that their papers involved errors. However, the papers were not retracted from the *American Economic Review* and the *National Bureau of Economic Research Working Papers*. The editors of the *American Economic Review* rejected their work.¹ Herndon et al. (2013b) published their paper in the *Cambridge Journal of Economics* in 2013.

7.2 Primum Non Nocere

Scientists can cause harm in many ways.² They plagiarize.³ They also fabricate and falsify data (Fanelli 2009). If you think these are all an economist needs to know about harm in science, you might be seriously wrong (Necker 2014). Working papers published on the websites of Replication Network⁴ and Replication Wiki⁵ have shown that the authors of a significant number of articles in economics have not disclosed their data and computer codes for independent researchers to test the model of the original article. Papers presented at conferences⁶ and special issues of

¹Personal correspondence with Thomas Herndon (September 2018). See also Jakob Kapeller’s editorial in the *Heterodox Economics Newsletter*, 3 March 2014.

²Plagiarism, (data) falsification, and (data) fabrication (or manufacturing) have considered to be the most common and significant forms of research misconduct by the authorities of research integrity around the globe, including the Office of Research Integrity (US), the National Institutes of Health (UK), and ALLEA – All European Universities (EU).

³See the RePEc Plagiarism Page available online at <https://plagiarism.repec.org> [Accessed March 2019]. See also Enders and Hoover (2004) and Karabag and Berggren (2012).

⁴Replication Network: <https://replicationnetwork.com/>; [Accessed March 2019].

⁵Replication Wiki: http://replication.uni-goettingen.de/wiki/index.php/Main_Page [Accessed March 2019].

⁶See for instance “the International Workshop on Scientific Misconduct and Research Ethics in Economics” (organized by Association for Social Economics and Ankara University, held in Izmir, Turkey, August 2014), “Replication in Microeconomics,” “Meta-analysis of Reproducibility in Economics Research,” and “Replication and Ethics in Economics: Thirty Years after Dewald,

economics journals⁷ report that a significant portion of the previously published works that are replicable are either unverifiable or invalidated. Blogposts published by Retraction Watch⁸ suggest that economists have continued to cite the articles that were retracted by the journals in which the articles were published.

The number of academic articles and books on research ethics in economics are continuously growing. Since the 1990s, economic methodologists such as Deirdre N. McCloskey, Arjo Klamer, Stephen T. Ziliak, James R. Wible, and George F. DeMartino, among others, have expressed concerns regarding a persistent problem in applied economics. They argued that the economic profession has ignored “the ethical challenges that attend the profession’s influence over the lives of others.”⁹ Economic methodologists have also claimed that the issues related to the scientific integrity in economics have become a pressing issue since the 2008 Financial Crisis.¹⁰ The foundations of economic science are now seriously challenged by the cumulative consequences of a general absence of accountability and responsibility in economic research. A growing interest among economists in research integrity in economics suggests that research ethics will soon be the next turn in economic methodology where the consequences of questionable research practices will be discussed and analysed.¹¹

Our primary goal in this paper is to introduce and develop this new focus. We think that the theories that cannot be verified and validated by empirical data should be abandoned (Yalcintas 2016). Economists who do not abandon unverified and invalidated theories give rise to an ethical problem in the profession. Economists who do not abandon the theories when theories are unverified or invalidated by empirical facts do not behave according to the “standards for intellectual honesty,” as Imre Lakatos (1970) once put it. As the case of Reinhart and Rogoff shows, however, economists stick to their guns when they are challenged by counterevidence and refuting argumentation.

We claim that economics should be a part of a system of research ethics.¹² Research ethics is a field of study in which scholars examine the harmful consequences of researchers who are involved in questionable research practices. As

Thursby, and Anderson” (organised by the American Economic Association, held in Chicago, IL, January 2017), and many other events organized by the Association for Integrity and Responsible Leadership in Economics and Associated Disciplines. See the AIRLEAP website at <http://www.airleap.org> [Accessed October 2018].

⁷See, for instance, the *Review of Social Economy*, Special Issue on “Scientific Misconduct and Research Ethics in Economics” (2016). See also the calls for papers by *Energy Economics* and the *Journal of Economic Psychology* that will publish special issues on replication studies in 2018 or later.

⁸Retraction Watch: <https://retractionwatch.com/category/by-subject/economics/> [Accessed October 2018].

⁹DeMartino and McCloskey (2015).

¹⁰DeMartino (2011a, b), Dow (2013).

¹¹Wible (2016), Yalcintas and Wible (2016).

¹²See Kapp (1963, 3–4) who was among the first economists who put forth this argument.

David B. Resnik (2015) argues, “[m]any different disciplines, institutions, and professions have norms for behavior that suit their particular aims and goals. These norms also help members of the discipline to coordinate their actions or activities and to establish the public’s trust of the discipline.” In the absence of scholarly norms, self-interested researchers do not always cause the epistemic welfare of other scholars to grow. Scholarly norms include responsibility, accountability, respect, trustworthiness, and other scientific virtues that lead to a sustainable process of knowledge production. A sustainable process in science amounts to correcting errors in the first place. However, self-correction is not naturally embedded in scholarly practices. In order for errors to be corrected, the scholarly community not only need to be able to criticize the works of others. Among other things, the scholars should also be able to abandon the theories that are invalidated by counter evidence and refuting argumentation.

In the medical sciences, where there are a number of professional institutes doing research on questionable research practices, researchers are thoroughly trained before they are involved in new projects. Prestigious medical journals publish papers on research ethics as well. Economists have been inspired by biomedical scientists in many ways. However, research on questionable research practices in economics has not been common. Since the eighteenth century, economists have imitated the ways in which physicists conducted scientific research. Economists have also copied and reproduced various types of research practices in biomedical sciences. Since Dr. Quesnay who published his *Tableau Économique* in 1758, a book on which William Harvey’s invention of blood circulation played a biggest role, such economists as William Petty, John Locke, Joseph Clément Juglar, amongst many others, have either been trained in or heavily influenced by medical sciences.¹³ Today, biomedicine is in the process of becoming a dominant paradigm in economics. Economists use metaphors that they abduct from medical sciences, such as economic crises, toxic assets, recovery programs, healthy economies, and economic prescriptions written by IMF and World Bank. More importantly, economists’ ways of conducting research resembles the ways in which biomedical scientists conduct theirs. Economists publish fewer and fewer books than articles in which an increasing number of them are being multi-authored rather than single authored. The number of citations to the work of an economist is as important as the argument of the work. As it has become more visible to the general public since the 2008 Financial Crisis, amounts of research monies granted to economists and salaries paid to economists sitting in the advisory boards of big companies of the banking industry all around the world without being accountable to the public are more or less identical to those of the pharmacologists, cancer researchers etc. In other words, types of questionable research practices in economics are similar to the types in biomedical sciences but there is no powerful sign of concern amongst economists toward internalizing the spill-over effects of questionable research practices. We claim that *primum non nocere* (“first, do no harm”) is not only one of the principles that medical

¹³Groenewegen (2001), Clément (2003).

students are taught at health institutions. It should also be a condition for economists to reach their ideals. We see morality as a must-condition for economics based on facts.

Therefore, we ask: what if economists and their subjects are not rational? While we were formulating the research question, we were inspired by one of the works of Arjo Klamer, entitled “As If Economists and Their Subject were Rational” (1987), in which he argued that “[t]he real goal is not to know how we ... can design rational criteria of truthfulness; it is instead to comprehend how economists actually argue and how their argumentation works.” He claims that economics is an art of persuasion and the assumption of rationality is a metaphor where economists study their subject of research (i.e. humans) as if they are rational. Most of us would argue that humans are *not* always rational. Klamer would agree. “Talk based on the pretense that everyone is rational,” Klamer says, “may simply not be that interesting.” However, one of consequences of not designing rational criteria of truthfulness is the loss of fact-checking and verification. In his article, Klamer does not confront the results of a fact-free world. It is obvious that a post-fact economics is not what Klamer has intended when he argued against rational criteria of truthfulness. Then, the research question becomes the following: What are the consequences of the behaviour of the economists who are not rational?

We think that the consequences of the fact that economists and their subjects are not always rational have been understudied.¹⁴ The problem is so significant that economics is not able to satisfy the principal criterion for science and scientific theories that several philosophers of science have formulated since the logical positivists in the Vienna Circle in the 1920s: In order for a theorem to be meaningful, it has to be confirmed by the facts of the world. Today, logical positivism (or “verificationism,” as many philosophers of science would like to call it) is “perceived almost universally as a villain,” Wade Hands (2001, 72) argues, “a wrong move that is responsible for much of what is wrong in nearly every intellectual discipline.” As a result, only a limited number of economic methodologists¹⁵ have studied the nature and consequences of the absence of verification, an ideology that Karl Popper (1935/2002, 18) once thought is “logically inadmissible.” We disagree. We argue that the increasing frequency of unverified and invalidated theories in economics suggests that economics suffers from the consequences of a questionable research practice in the processes of scientific knowledge production – the practice of refusing to reject theories that are invalidated by hard evidence and counter argumentation.

¹⁴Necker (2016), Hoover (2006).

¹⁵Ward (1972), Hutchison (1984), Machlup (1955 and 1984).

7.3 Post-factual Economics

It has been more than a decade since the 2008 Financial Crisis hit the global economy. There is now a growing economic literature on the nature and consequences of the crisis. One of the widely accepted views about the crisis has been that it was not only a crisis of the global economy; it was a crisis of the economics profession as well.¹⁶ Economists have played roles in the emergence of the crisis.

However, we have found that research ethics has not been commonly taught in economics departments around the globe since then. The number of papers published in the journal of economics education and economic methodology is also very limited.¹⁷ In our view, it is not unfair to say that the issue of immorality among economists has been disguised in the abstract debates in economic methodology since the 2008 Financial Crisis.¹⁸ We think that being suspicious about hard facts and evidence has played a role in excluding ethics from methodological debates in economics. As Boumans and Davis (2010, 171) argue “[t]he most important methodological value judgments in economics involve three kinds of choices made by economists regarding how economics should be carried out: (i) the choice of the subject matter to be investigated; (ii) the method to be used in investigating that subject matter; and (iii) the criteria standards, and norms used to assess and judge the validity of the investigation’s outcomes.” Indeed, theory rejecting is as important as theory choosing. The former is an ethical matter whereas the latter is methodological.

One of the first sources that helped the economists to focus their attention on the nature of the 2008 Financial Crisis was *Inside Job* (2010), a Hollywood documentary, directed by Charles Ferguson. This documentary not only explained how the complex financial tools worked. It also gave an overview of the period of deregulation from the 1980s to date. The view that the documentary held was that big companies such as Goldman Sachs, Morgan Stanley, and Lehman Brothers knew that the crisis was coming; but they did not do anything about it. The documentary was shown in Cannes, Toronto, and New York film festivals in 2010. It also won the 2010 Academy Award.

Inside Job is the first-ever Hollywood production that touches upon the issue of research ethics in economics. Ferguson argues that the economics profession is fully corrupted. The documentary provides evidence that economists write reports to financial companies and consulting agencies, but they do not always express it openly that they do. According to Ferguson, this leads to the issue of conflict of interest in economics.

Conflict of interest in the academe is a big issue.¹⁹ But it is not the only form of questionable research practices. Mathematization, amongst others, has also been an

¹⁶ Colander et al. (2009), Kirman (2010), Elliot (2010), Lawson (2009), Harvey (2012).

¹⁷ Yalcintas and Selçuk (2016).

¹⁸ Maziarz (2017).

¹⁹ Valdés (1995), Mirowski (2002), Perkins (2004), Easterly (2006).

issue that economic methodologists have focused their attention on in their criticisms. For instance, Jesus M. Zaratiegui (1999) argues that “[m]athematics is a powerful symbol of the internal logical consistency that economics has developed during this century. Nevertheless, it has been accused of making a non-critical use of mathematical methods and of converting these methods into a weapon of economic imperialism.” Likewise, in two of his most recent papers, the 2018 Nobel Memorial laureate Paul Romer argues that macroeconomic theory suffers from the lack of empirical evidence to support the mathematical models of economic growth. He calls it “mathiness.” Mathiness, according to Romer, is a misuse of mathematics where economists do not provide the reader with the facts of the world to back up the theoretical model. Romer (2016b) thinks that non-existent empirical content in economics “signals a shift from science to academic politics” causing a scientific failure:

The style that I am calling mathiness lets academic politics masquerade as science. Like mathematical theory, mathiness uses a mixture of words and symbols, but instead of making tight links, it leaves ample room for slippage between statements in natural versus formal language and between statements with theoretical as opposed to empirical content.

Romer is not against the use of unrealistic assumptions in economics. He is concerned, however, with the fact that mathematical macroeconomic models cannot be verified because the models are not tested whether they fit to the true facts of the world. Romer’s views on macroeconomic theory, according to our understanding, are a reformulation of the general discontent among many economic methodologists who have pointed out the risks of the overuse and misuse of mathematical techniques in applied economics since the WWII. Paul Romer, a macroeconomist who has been known for his mathematical contributions to the literature on endogenous growth theory, made the point although he did not provide evidence in some of his most cited papers, such as “Endogenous Technical Change”²⁰ and “Economic Integration and Economic Growth”,²¹ to support his mathematical models, either. But he is as clear as any professional economic methodologist:

My conjecture is that string theory and post-real macroeconomics illustrate a general failure mode of a scientific field that relies on mathematical theory ... conformity to the facts is no longer needed as a coordinating device. As a result, if facts disconfirm the officially sanctioned theoretical vision, they are subordinated. Eventually, evidence stops being relevant (Romer 2016b).

²⁰ Romer (1990).

²¹ Rivera-Batiz and Romer (1991).

7.4 The “New” Dichotomy

Economics profession has long suffered from fact-free theorizing. The arguments “proven” with some tests of statistical significance²² under certain (and unlikely) circumstances have been accepted and widely used as if the models were verified by facts and data. As Toby Young (2016) put it “we are all post-truthers and probably always have been.”

“We are living in a world of post-truth,” says Ralph Keyes in his book, *The Post Truth- Era: Dishonesty and Deception in Contemporary Life* (2004) “Post-truthfulness exists in an ethical twilight zone. It allows us to dissemble without considering ourselves dishonest.” The prevalence of factually inaccurate conclusions in economics have also drawn the attention of many economists since the 2008 Financial Crisis. The problem that we think has led to post-factual theorizing in economics is that economists do not behave responsibly while they conduct research. The main source of the lack of responsibility is that

- economists do not refer to data and facts
- they do not abandon theories when theories are refuted by data and facts

Originally, an understanding of ethics in science refers to the normativity debate on the dichotomy between “is-statements” and “ought-to-statements.” The following statement is an is-statement: “The average rate of the US annual growth was over 4% between 1983 and 1988.” The statement is replicable and it is produced by the researchers who are allegedly accountable at the World Bank.²³ However, the following statement is an ought-to-statement where the proposition is prescriptive and originating from an opinion: “In order for the global economy to achieve sustainable growth, it ought to introduce the free market policies of the US.” The normativity debate has been popular in economic methodology since David Hume first formulated it in his *A Treatise on Human Nature* (1739). Many economic methodologists have often referred to it when they talked about “value judgments” and “morality.”²⁴

Here, we claim that in order for economists to remedy the problems of the age of post-factual economics, economists should reconsider the old dichotomy with new lenses. The “new” dichotomy refers to the logical distinction between a correct statement (or “is-statement”) and an incorrect statement (or “is-not-statement”). Economists should insist on working with is-statements (such as “According to IMF, the global economy grew at 3.5% in 2017”²⁵) whereas they should reject is-not statements (such as “... median growth rates for countries with public debt over

²² Ziliak and McCloskey (1996, 2004, 2008).

²³ Source: <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=US> [Accessed March 2019].

²⁴ For instance Blaug (1980, 49–134).

²⁵ Source: https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOWORLD Accessed March 2019.

roughly 90% of GDP are about 1% lower than otherwise; average (mean) growth rates are several percent lower”²⁶). Failure to distinguish between an is-statement and an is-not-statement, which is in fact a logical condition, gives rise to ethical problems in scientific research. An is-statement is a statement where the model or explanation is evidenced by data and verified by the facts of the world. An is-not-statement, on the other hand, is a statement where the model cannot be supported by data and facts. Today, an understanding of ethics amounts to bringing data and facts back into science so that we can distinguish between correct and incorrect statements.

When economists do not reject a refuted theory, they do not behave responsibly to the audience because economists who keep using an is-not-statement inflict harm on other researchers. The condition for economists to account for the world in meaningful ways, they are required to stick to is-statements and reject is-not-statements. In order for a theory to produce a meaningful explanation, the theory should be verified with facts in the first place. Only theories that are verified by facts can lead to meaningful explanations. In other words, economics is not only value-laden, it is also fact-laden.

Fact-ladenness of a theory is a condition for the process of knowledge production to operate without interruptions. Interruption can occur when economists are not able to correct inconsistencies and manipulations. If a theory is free from facts, it is unlikely that a criticism is able to eliminate the abstract nature of the theory where the theory is not able to account for the causes of an event. Under such conditions, academic conversations can be easily locked in to ideological nonsense where the explanation does not have any relevance to the facts of the world. In other words, fact-free theories do not always produce pragmatic results about the world in which we live.

Theories that are free from facts cause opinions to replace evidence in scientific inquiry. An economist who only refers to opinions can build fictive models in which critics might be unable to spot erroneous contents. Fictive models are often able to account the facts of the world. Although the main problem is not necessarily fictive models *per se*, as the case of Reinhart and Rogoff suggests; is-not-statements that are invalidated by evidence inflict harm on the community of researchers as well as the general public.

7.5 Looking Forward

Economists have long been interested in the state of economics.²⁷ Back in the 1970s, Wassily Leontief focused on the misuse of mathematics in economics. In his “Theoretical Assumptions and Nonobserved Facts” (1971), he claimed that “[i]n the presentation of a new model, attention nowadays is usually centered on a

²⁶ The statement belongs to (Reinhart and Rogoff 2010b) and it is refuted by Herndon et al. (2013b).

²⁷ Babbage (1830), Marx (1859), Veblen (1909), Hoover (1926).

step-by-step derivation of its formal properties ... By the time it comes to interpretation of the substantive conclusions, the assumptions on which the model has been based are easily forgotten ... What is really needed, in most cases, is a very difficult and seldom very neat assessment and verification of these assumptions in terms of observed facts.” In fact, the finding of Reinhart and Rogoff that “median growth rates for countries with public debt over roughly 90% of GDP are about 1% lower than otherwise; average (mean) growth rates are several percent lower” was, in Leontief’s terms, a “nonobserved fact.” Therefore, one of the questions that economic methodologists often asks is the following: What is wrong with economics?²⁸ Economists, to a large extent, believe that ethics is irrelevant to what they are doing in the labs, classrooms, and conference halls. Especially applied fields of economics in which economists use data and algorithms to account for what they think is important for the economy is where morality and ethics are least requested.

As *The Economist* (2016) put it straightforwardly, “humans do not naturally seek truth. In fact, as plenty of research shows, they tend to avoid it.” Historically, we think that abstention from data and facts has started with David Ricardo. Ricardo was one of the first steps to also move away from the moral philosophies of Adam Smith and David Hume. When Ricardo thought that he refuted Smith’s theory of value, he in fact refuted the morality that Smith’s theory involved.

Abstract methods, many applied economists would tell, do not require ethics and morality. For instance, in *The Elements of Pure Economics* (1874), one of the most influential works in the history of economics, Léon Walras (1874, 39) claimed thus: “we need not concern ourselves with the morality or immorality of any desire which a useful thing answers or serves to satisfy.” Milton Friedman (1953, 180–213) agreed with Walras when he argued that: “Positive economics is in principle independent of any particular ethical or normative judgements.” Economics requires excellence in using the tools that an economist is equipped with. Besides all, there are certain mechanisms that deal with the consequences of immoral behaviour. If you are a doctoral student, your advisor will monitor your actions. But if you are a professional economist, does your department or your faculty hold you responsible for your actions at the universities at all times? The evidence suggests that this is always the case. We think that the unresponsiveness among economists has a lot to do with the belief that “truth will out.” Indeed, why do economists need to concern themselves with “the morality or immorality” of a subject if the truth, as Hercule Poirot (David Suchet) said it in one of the episodes of *Agatha Christie’s Poirot* (2013), “has the habit of revealing itself”? It is this belief that economic methodologists should question.

²⁸ Fullbrook (2004), Coy (2009), Bell and Kristol (1981), Krugman (2009).

References

- Babbage, C. 1830. *Reflections on the decline of science in England, and on some of its causes*. London: B. Fellowes etc.
- Bell, D., and I. Kristol. 1981. *The crisis in economic theory*. New York: Basic Books.
- Blaug, M. 1980 [1987]. *The methodology of economics: How economists explain*. Cambridge: Cambridge University Press.
- Boumans, M., and J.B. Davis. 2010. *Economic methodology: Understanding economics as a science*. New York: Palgrave.
- Clément, A. 2003. The influence of medicine on political economy in the seventeenth century. *History of Economics Review* 38 (Summer): 1–22.
- Colander, D., M. Goldberg, A. Haas, K. Juselius, A. Kirman, T. Lux, and B. Sloth. 2009. The financial crisis and the systematic failure of academic economics. *Critical Review: A Journal of Politics and Society* 21 (2–3): 249–267.
- Coy, P. 2009. What good are economists anyway? *Bloomberg Businessweek*, April 16.
- DeMartino, G.F. 2011a. *The economist's oath: On the need for and content of professional economics ethics*. Oxford: Oxford University Press.
- . 2011b. On the need for professional economic ethics. *The Economist*, January 6.
- DeMartino, G.F., and D. McCloskey. 2015. *The Oxford handbook of professional economic ethics*. Oxford: Oxford University Press.
- Dow, S.C. 2013. Codes of ethics for economists: A pluralist view. *Economic Thought: History, Philosophy, and Methodology* 2 (1): 20–29.
- Easterly, W. 2006. *The white man's burden: Why the west's efforts to aid the rest have done so much ill and so little good*. Oxford: Oxford University Press.
- Elliot, L. 2010. Rescuing economics from its own crisis. *The Guardian*, November 8.
- Enders, W., and G.A. Hoover. 2004. Whose line is it? Plagiarism in economics. *Journal of Economic Literature* 42 (2): 487–493.
- Fanelli, D. 2009. How many scientists fabricate and falsify research? A systematic review and meta-analysis of survey data. *PLoS One* 4 (5): 1–11.
- Friedman, M. 1953 [1984]. The methodology of positive economics. In *The philosophy of economics: An anthology*, ed. D.M. Hausman, 180–213. Cambridge/New York/Sydney: Cambridge University Press.
- Fullbrook, E. 2004. *A guide to what is wrong with economics*. London: Anthem Press.
- Groenewegen, P.D. 2001. *Physicians and political economy: Six studies of the work of doctor-economists*. London/New York: Routledge.
- Hands, D.W. 2001. *Reflection without rules: Economic methodology and contemporary science theory*. Cambridge: Cambridge University Press.
- Harvey, J.T. 2012. How economists contributed to the financial crisis. *Forbes*, June 2.
- Herndon, T., Ash, M., & Pollin, R. 2013a. *Does high public debt consistently stifle economic growth? A critique of Reinhart and Rogoff*. PERI working paper series: 322.
- Herndon, T., M. Ash, and R. Pollin. 2013b. Does high public debt consistently stifle economic growth? A critique of Reinhart and Rogoff. *Cambridge Journal of Economics*. <https://doi.org/10.1093/cje/bet075>.
- Hoover, G.E. 1926. The present state of economic science. *Social Forces* 5 (1): 57–60.
- Hoover, G.A. 2006. A game-theoretic model of plagiarism. *Atlantic Economic Journal* 34 (4): 449–454.
- Hutchison, T.W. 1984. On verification in economics. In *The philosophy of economics: An anthology*, ed. D.M. Hausman. Cambridge/New York/Sydney: Cambridge University Press.
- Kapp, K.W. 1949 [1963]. Economics as part of a system of applied ethics. In *History of economic thought: A book of readings*, ed. K.W. Kapp. New York: Barnes and Noble.
- Karabag, S.F., and C. Berggren. 2012. Retraction, dishonesty and plagiarism: Analysis of a crucial issue for academic publishing, and the inadequate responses from leading journals in

- economics and management disciplines. *Journal of Applied Economics and Business Research* 2 (3): 172–183.
- Keyes, R. 2004. *The post-truth era: Dishonesty and deception in contemporary life*. New York: St. Martin's Press.
- Kirman, A. 2010. The economic crisis is a crisis for economic theory. *CESifo Economic Studies* 56 (4): 498–535.
- Klamer, A. 1987. As if economists and their subject were rational. In *The rhetoric of the human sciences: Language and argument in scholarship and public affairs*, ed. J.S. Nelson, A. Megill, and D.N. McCloskey, 163–183. Madison: University of Wisconsin Press.
- Krugman, P. 2009. How did economists get it so wrong? *The New York Times*, September 6.
- Lakatos, Imre. 1970. Falsification and methodology of scientific research programmes. In *Criticism and growth of knowledge*, ed. Imre Lakatos and Alan Musgrave, 170–196. Cambridge: Cambridge University Press.
- Lawson, T. 2009. The current economic crisis: Its nature and the course of academic economics. *Cambridge Journal of Economics* 33 (4): 759–777.
- Leontief, W. 1971. Theoretical assumptions and nonobserved facts. *American Economic Review* 61: 1–7.
- Machlup, F. 1955. The problem of verification in economics. *Southern Economic Journal* 22 (1): 1–21.
- . 1984. On indirect verification [Rejoinder to a reluctant ultra empiricist]. In *The philosophy of economics: An anthology*, ed. D.M. Hausman. Cambridge/New York/Sydney: Cambridge University Press.
- Marx, K. 1859. *Zur Kritik der Politischen Ökonomie*. Berlin: F. Duncker.
- Maziarz, M. 2017. The Reinhart-Rogoff controversy as an instance of the 'emerging contrary result' phenomenon. *Journal of Economic Methodology* 24 (3): 1–13.
- Mirowski, P. 2002. *Machine dreams: Economics becomes a cyborg science*. Cambridge: Cambridge University Press.
- Necker, S. 2014. Scientific misbehavior in economics. *Research Policy* 43 (10): 1747–1759.
- . 2016. Why do scientists cheat? Insights from behavioral economics. *Review of Social Economy* 74 (1): 98–108.
- Perkins, J. 2004. *Confessions of an economic hitman*. Ebury Press.
- Popper, K.R. 1935 [2002]. *The logic of scientific discovery*. London/New York: Routledge.
- Reinhart, C. M., Rogoff, K. 2010a. Growth in a time of debt. NBER discussion paper no. 15639.
- Reinhart, C.M., and K. Rogoff. 2010b. Growth in a time of debt. *American Economic Review: Papers and Proceedings* 100: 573–578.
- Reinhart, C.M., and Rogoff, K. 2013. Debt, growth, and austerity debate. *New York Times*, April 25.
- Resnik, D. B. 2015. *What is ethics in research, and why is it important?* National Institute of Environmental Health Sciences. <https://www.niehs.nih.gov/research/resources/bioethics/whatis/>. Accessed Mar 2019.
- Rivera-Batiz, L.A., and P. Romer. 1991. Economic integration and endogenous growth. *Quarterly Journal of Economics* 106 (2): 531–555.
- Romer, P. 1990. Endogenous technical change. *Journal of Political Economy* 98 (5): S71–S102.
- . 2016a. The trouble with macroeconomics. *The American Economist*. <https://ccl.yale.edu/sites/default/files/files/The%20Trouble%20with%20Macroeconomics.pdf>. Accessed Mar 2019.
- . 2016b. Mathiness in the theory of economic growth. *American Economic Review* 105 (5): 89–93.
- The Economist*. 2016. Yes, I'd lie to you. September 10.
- Valdés, J.G. 1995. *Pinochet's economists: The Chicago School of Economics in Chile*. Cambridge: Cambridge University Press.
- Veblen, T. 1909. The limitations of marginal utility. *Journal of Political Economy* 17 (9): 620–636.
- Walras, L. 1874 [2010]. *Elements of pure economics*. London.
- Ward, B. 1972. *What's wrong with economics*. New York: Basic Books.

- Wible, J.R. 2016. Scientific misconduct and the responsible conduct of research in science and economics. *Review of Social Economy* 74 (1): 7–32. <https://doi.org/10.1080/00346764.2016.1135598>.
- Yalcintas, A. 2016. *Intellectual path dependence: Why economists do not reject refuted theories*. London: Routledge.
- Yalcintas, A., and I.Ş. Selçuk. 2016. Research ethics education in economics. *Review of Social Economy* 74 (1): 53–74.
- Yalcintas, A., and J.R. Wible. 2016. Scientific misconduct and research ethics in economics: An introduction. *Review of Social Economy* 74 (1): 1–6.
- Young, T. 2016. The truth about ‘post-truth politics’. *The Spectator*, July 16.
- Zaratiegui, M. Jesus. 1999. The imperialism of economics over ethics. *Journal of Markets & Morality* 2 (2): 208–219.
- Ziliak, S.T., and D.N. McCloskey. 1996. Standard error of regression. *Journal of Economic Literature* 34 (1): 97–114.
- . 2004. Size matters: The standard error of regression in the American Economic Review. *Journal of Socio-economics* 33 (5): 527–546.
- . 2008. *The cult of statistical significance: How the standard error costs us jobs, justice, and lives*. Ann Arbor: University of Michigan Press.

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