

# Philosophy of Economics? Three Decades of Bibliometric History

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December 4, 2020

## Abstract

Using bibliometric data and social network analysis, this chapter maps the intellectual output of two philosophies or methodologies of economics since the early 1990s. The first set of research stems from the specialized field. We show that the existing interpretive literature captures relatively well its main divisions. The second set is made of publications that are coded as ‘Economic Methodology’ by the JEL Classification System, but that are otherwise not part of the specialized field. We find that this other philosophy of economics has concerns that are different from field publications, including a continuing interest for the heterodoxy in economics. The existing interpretive literature has failed to recognize this diversity among philosophies of economics.

**Keywords:** scientometrics, bibliometrics, economic methodology, philosophy of economics, quantitative history

**JEL Codes:** B4, B29

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# 1 Introduction

What is philosophy of economics? An intuitive approach to this question would be to define the two terms – philosophy and economics – and then find ways the two could intersect. We do not adopt this strategy. Ours is inspired by the sociology of science, which has firmly established that any scientific subcategory – and, indeed, science itself (Gieryn, 1983) – is the outcome of social processes of inclusion and exclusion (Whitley, 2000; Abbott, 2001). Hence, instead of trying to capture what corresponds to some *a priori* definition of ‘philosophy of economics,’ we propose to take a serious look at what has been socially characterized as such.

A first social property of our object is its dual labels: many scholars switch almost seamlessly between ‘philosophy of economics’ and ‘economic methodology.’ Although ‘philosophy’ and ‘methodology’ are hardly synonyms, the two labels are roughly interchangeable when it comes to linguistic practices. The interchangeability is only rough because the distinction is itself ground for boundary-work – for instance, Mäki (2012, p. xv) suggests that the choice of label depends “on the primary disciplinary context of the activity.”

Once this ambivalence is accepted, two ways are open to identify ‘philosophy of economics.’ First, it is an established research field. It is structured like all scientific fields: with learned societies (most prominently, the International Network for Economic Method or INEM), institutes, specialized journals, anthologies and handbooks. In the rest of the chapter, we will refer to this field as ‘Specialized Philosophy of Economics.’ Second, the JEL Classification System has one code for ‘Economic Methodology’ (code B4 since 1991), which allows us to identify another philosophy of economics. The JEL System is “a standard method of classifying scholarly literature in the field of economics.”<sup>1</sup> It has been developed and updated through a series of negotiations (for a detailed history of these social processes, see Cherrier, 2017). In what follows, we will refer to the body of work identify by the relevant JEL code with the phrase ‘JEL Economic Methodology.’ More precisely, we will exclude from JEL Economic Methodology the work that falls into Specialized Philosophy of Economics. By this procedure, we can compare two mutually exclusive philosophies of economics: one representing a specific scientific field and the other a collection of work tagged with a specific code in a standard classification system, but not directly associated to the established field.

Our goal in this chapter is to map the content of these two philosophies of economics. All maps are perspectival – they do not show all there is about a location – but any good map informs us about some relevant structural features of the location. Our map – using bibliometric data and network analysis – is meant to show some of the most popular subject matters of the two philosophies of economics, and to indicate changes in their popularity over the last 30 years. Since subject matters can be individuated in various ways, other detection techniques might find subject matters that do not exactly correspond to ours.<sup>2</sup> Yet, our

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<sup>1</sup>From <https://www.aeaweb.org/econlit/jelCodes.php> (last accessed: 2020-10-02)

<sup>2</sup>In a companion paper (Truc et al., 2020), we use a different technique (decade-long co-citation networks) on Specialized Philosophy of Economics. The subject matters discovered are highly similar, but not identical to what we present here. A recent article also shows that economics, as compared to other scientific disciplines, has grown less interested in the philosophy of science since the 1980s (Khelifaoui et al., 2021).

results do capture important structural features of the two philosophies of economics, as well as key differences between the two.

In Section 2, we present our data and, in Section 3, our method. Results and discussions about the two philosophies of economics are contained in Section 4. The discussions are where we relate our findings to claims found in the existing literature on the content and evolution of philosophy of economics. To keep each section short, we have pushed additional material to a Technical Appendix.<sup>3</sup> It includes a detailed presentation of our procedure, the R code used to generate our results, and additional tables and figures.

## 2 Data

It is well established that systematically studying citation patterns gives a valuable perspective on the cognitive structure of science (Cole et al., 1978; Boyack et al., 2005). This type of work has been applied to a variety of fields, including economics (e.g., Claveau and Gingras, 2016; Angrist et al., 2020) and philosophy (Noichl, 2019). We thus suggest to use citation data originating from the two ‘philosophies of economics’ under study to uncover the evolution of their contents since the 1990s.

The first corpus represents Specialized Philosophy of Economics – a field that started taking shape in the late 1970s. Among influential philosophers of economics, the consensus is that there are two main field journals: Economics and Philosophy (E&P) and the Journal of Economic Methodology (JEM).<sup>4</sup> We have retrieved from Elsevier’s Scopus database<sup>5</sup> all articles and reviews published in these two journals from 1990 to 2019 inclusively (30 years). Since JEM started publishing in 1994, we only have data from E&P for the first four years. The 1007 documents – 475 in E&P and 532 in JEM – have in total 33,760 references. Some data cleanup routines have been necessary for these references, especially to improve on the detection of cited books (which are plenty in the field).

The second corpus – i.e., JEL Economic Methodology – couples EconLit<sup>6</sup> with Web of Science.<sup>7</sup> EconLit allows us to retrieve documents tagged with the relevant JEL codes. We then find in Web of Science a subset of these documents, a procedure which gives us, most importantly, the full references of these documents.

The JEL Classification System has been quite stable since 1991 (Cherrier, 2017). In its hierarchical structure, it includes a code ‘B4 Economic Methodology’, situated below ‘B. History of Economic Thought, Methodology, and Heterodox Approaches’ and above ‘B40 General’, ‘B41 Economic Methodology’ and ‘B49 Other.’ In the prior classification system, ‘Economic Methodology’ was code 00360.

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<sup>3</sup>See <https://doi.org/10.5281/zenodo.4306372>

<sup>4</sup>This consensus is expressed, among others, by Hausman (2008, sec. 4), Mäki (2012, p. xv) and (Hands, 2015, p. 62). Needless to say that there are now other journals in the field, including the *Erasmus Journal for Philosophy and Economics*. We made sure that these other journals are not included in our second corpus.

<sup>5</sup><https://www.scopus.com/home.uri>

<sup>6</sup>We use the version hosted by EBSCO: <https://www.ebsco.com/products/research-databases/econlit-full-text>

<sup>7</sup>We use the version hosted by the Observatoire des sciences et technologies: <https://www.ost.uqam.ca/>

EconLit indexes “the most sought-after economics publications.”<sup>8</sup> A noteworthy but little known feature of EconLit is that professional classifiers select the final codes for each document (Cherrier, 2017, p. 569), although authors typically suggest codes and journals themselves can use these author-provided codes. Consequently, the documents that we retrieve as ‘Economic Methodology’ in EconLit are those that have been judged to be such by a standardized procedure of the American Economic Association.

Two characteristics of the EconLit database required choices on our side. First, EconLit includes many types of documents – e.g., books, PhD theses – but we take only the content of academic journals. Second, it includes journals outside the standard frontier of economics, but deemed of interest to economists. For instance, it indexes the *American Political Science Review*. Since it is interesting to study the profile of articles in non-economics journals that are tagged as ‘Economic Methodology,’ we include articles irrespective of the disciplinary association of their journal.

Web of Science has a more selective coverage of journals than EconLit.<sup>9</sup> We nevertheless find 167 journals in Web of Science that have at least one article tagged as Economic Methodology in EconLit. Two further restrictions are applied on the corpus. First, we remove articles published in E&P and JEM to make our two corpora mutually exclusive. Second, we drop the 3 articles from 2019, because this small number is attributable to indexing delays in both EconLit and Web of Science. We are thus left with 1362 documents in 165 journals from 1990 to 2018, giving a total of 63,267 references. The journals producing most papers in this corpus are *Cambridge Journal of Economics* (13,1%), *Journal of Economic Issues* (6,7%) and *History of Political Economy* (6,5%). Using a classification of journals from the US National Science Foundation, we find that 77,5% of the articles in this corpus are published in a journal from economics, thus a sizable amount of articles come from journals having a less solid relationship with economics.

Figure 1 indicates the number of articles over the studied period in the two corpora. Publications per year are trending upward in both corpora, although the temporal distribution for JEL Economic Methodology is closer to a U-shape, with 2000 to 2009 being a decade with a comparatively lower output. An inspection of the documents most frequently cited by the corpora already signals that they are not mirror images of each other. Some references are almost equally popular in the two corpora – e.g., Friedman (1953) is first in Specialized Philosophy of Economics and second in JEL Economic Methodology. However, other sources have contrasting popularity. For instance, Hausman (1992) is the second most popular references in Specialized Philosophy of Economics while 27th in JEL Economic Methodology, while the most popular reference in this corpus – i.e., Lawson (1997) – is 11th in the other corpus.<sup>10</sup> We need a more systematic method to investigate these similarities and differences.

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<sup>8</sup><https://www.aeaweb.org/econlit/> (last accessed: 2020-10-06)

<sup>9</sup>For instance, the *Journal of Economic Methodology* is indexed in Web of Science only from 2013 onward. The fact that it does not go back to 1994 (the first issue) is the reason why we use Scopus rather than Web of Science for Specialized Philosophy of Economics.

<sup>10</sup>See Section 2.4 of the Technical Appendix for a table comparing the top 50 references in both corpora.

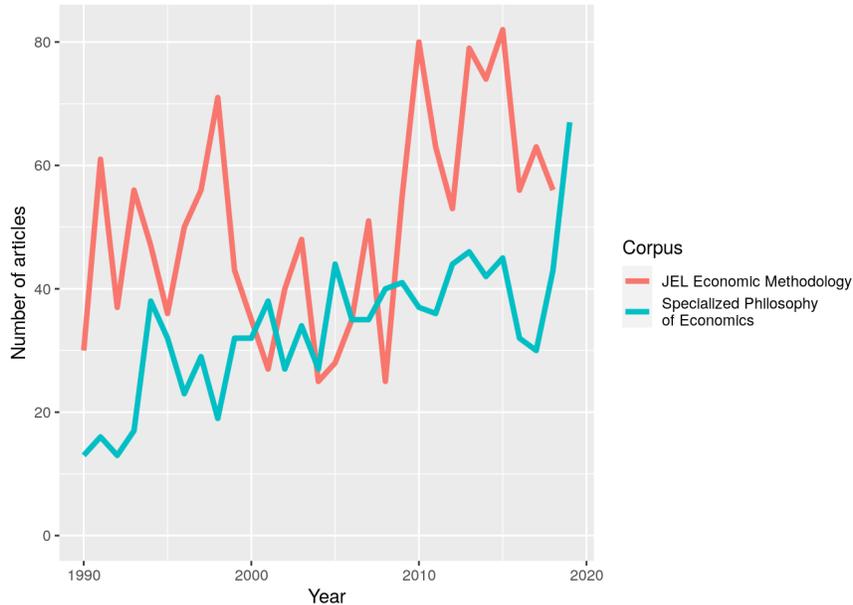


Figure 1: Number of articles in the two corpora

### 3 Method

References in scientific documents can be interpreted as constituting social networks. In this chapter, we focus on the similarity of citing documents. According to bibliographic coupling (Kessler, 1963), two documents are similar to the extent that they share entries in their respective bibliographies. Our normalized measure of this similarity takes into account the length of both bibliographies. If two papers have fully identical bibliographies, the weight of the edge connecting them is 1 while it is zero if their bibliographies have no reference in common.

We construct two bibliographic coupling networks; one for each corpus. The nodes of each network are thus documents that are published between 1990 and the late 2010s. On each network, we apply the Louvain community detection algorithm (Blondel et al., 2008), which creates a partition of nodes – i.e., of citing documents – by trying to maximize a measure called “modularity” (Newman and Girvan, 2004). A partition is highly modular to the extent that weighted edges inside each cluster tend to be higher than the average weighted edge. In other words, the algorithm identifies clusters of articles having more similar bibliographies among themselves than with articles in other clusters.

Community detection algorithms are heuristic devices to identify salient structural components in networks. The clusters detected should not be reified for three reasons. First, our algorithm has a stochastic component, which implies that results might vary slightly each time the algorithm is used. Second, the algorithm looks at a specific, fixed “resolution.” There are most certainly meaningful sub-clusters or macro-clusters that could be identified by an algorithm at a different resolution. Finally and most importantly, our method is only

one simple way to detect clusters in a network with an important temporal component. In the construction of our network and in the community detection, we treat the system as static – i.e., the year of publication of the citing documents is not taken into account. Only after the detection do we map the share of each cluster through time (see our Figures 2b and 3b). This method has the great advantage of simplicity, but numerous other options exist to include the temporal dimension more upstream in the method (see Rossetti and Cazabet, 2018, for a survey of options). We implemented the simple method as a first pass and found the results sufficiently telling for the purpose of this chapter.

Once the clusters are detected, we use two sources of information to identify what they are mostly about. First, we extract the most frequent references per cluster over the whole period and for each decade (see Tables 1 and 2). Second, we extract keywords from the title of the citing documents (the nodes) in each cluster. The identification of keywords is based on the standard term frequency-inverse document frequency (tf-idf). This measure takes into account the number of times each phrase appears in the cluster (tf), but also how unique the phrase is to this cluster relative to the cluster as a whole (idf).

Finally, we name each cluster. This step is where our insider knowledge as philosophers of economics plays a prominent role: based on the most frequent references and on the keywords for each cluster, it was relatively straightforward for us to manually attribute labels and thus go from a set of documents with a variety of property to an object called, e.g., ‘Big M’ or ‘Critical Realism’. These labels are mostly mnemonic devices and readers are free to rename the clusters at will.

## 4 Results and Discussions

We present our results for the two philosophies of economics in separate subsections. However, the second discussion – the one following the results about JEL Economic Methodology – uses the other philosophy of economics as an explicit contrast.

### 4.1 Specialized Philosophy of Economics

#### 4.1.1 Results

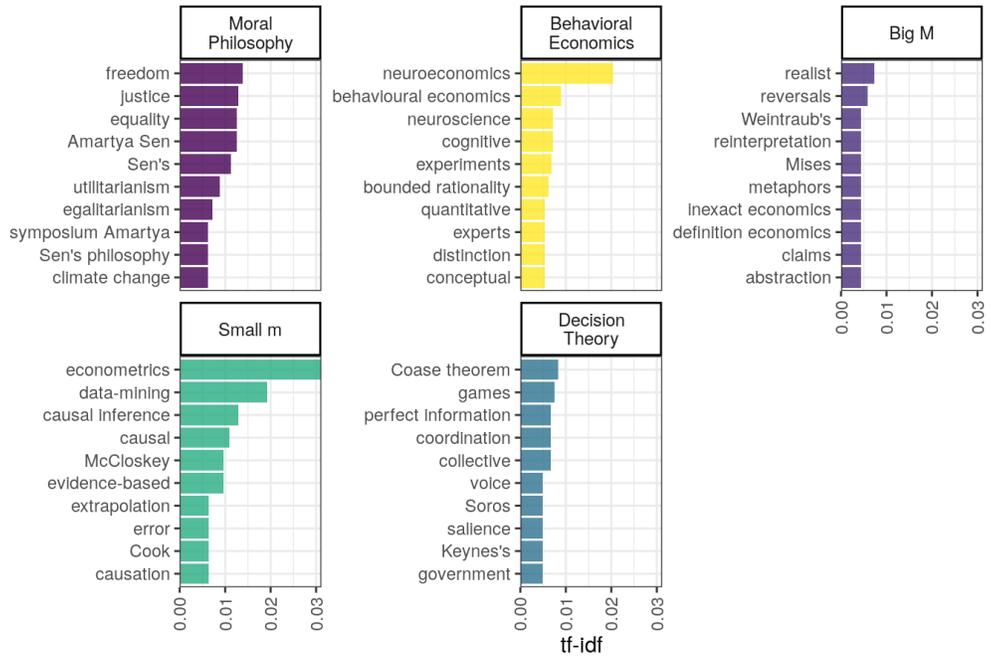
When applied to Specialized Philosophy of Economics, the method described in Section 3 detects five clusters. Using our knowledge of the field, we named these clusters by interpreting the phrases with the highest tf-idf scores (Figure 2a) and the documents cited most often in each cluster (Table 1):

**Moral Philosophy** ( $n = 277$ ): This cluster on moral and political philosophy includes overall more articles than any other in Specialized Philosophy of Economics. Rawls (1971) is its main reference and its keywords are unmistakably associated to the literature on liberal egalitarianism.

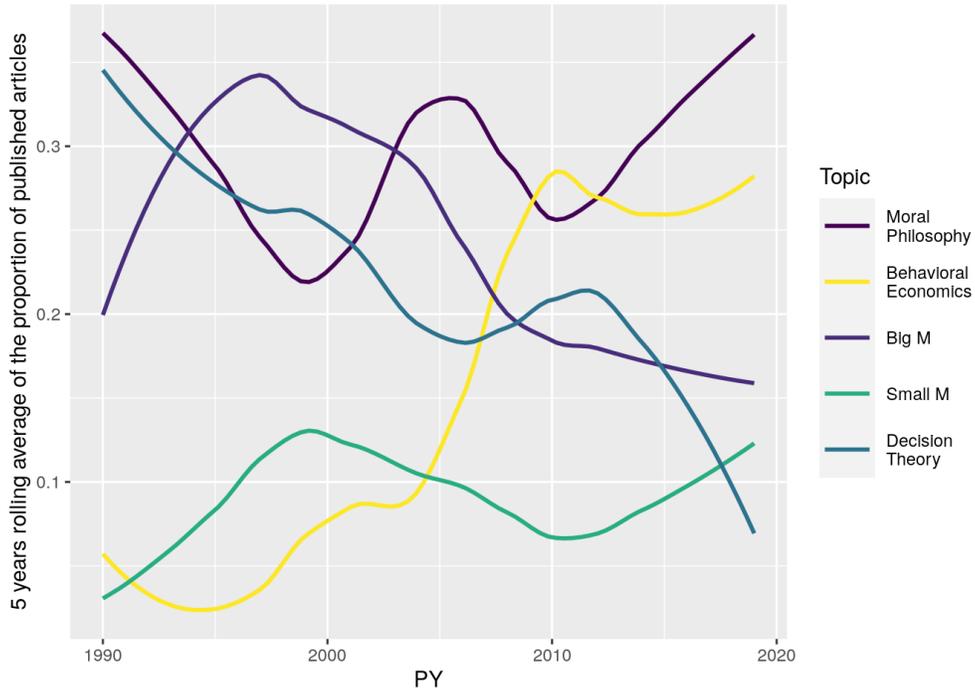
**Behavioral Economics** ( $n = 173$ ): This cluster regroups articles about philosophical issues concerning behavioral economics, neuroeconomics and experimental economics.

Cluster	Full period	1990-1999	2000-2009	2010-2019
Moral Philosophy	Rawls 1971	Rawls 1971	Rawls 1971	Rawls 1971
	Nozick 1974	Parfit 1984	Broome 1991	Sen 1999
	Parfit 1984	Nozick 1974	Nozick 1974	Sen 1970
	Sen 1970	Harsanyi 1955	Scanlon 1998	Broome 2004
	Broome 1991	Broome 1991	Arrow 1951	Harsanyi 1955
Behavioral Economics	Kahneman 1979	Kahneman 1979	Kahneman 1979	Savage 1954
	Savage 1954	Friedman 1953	Savage 1954	Kahneman 1979
	Camerer 2005	Keynes 1971	Ellsberg 1961	Camerer 2005
	Gul 2008	Allais 1953	Smith 1982	Gul 2008
	Ross 2005	Becker 1993	Allais 1953	Kahneman 2011
Big M	Hausman 1992	Hausman 1992	Hausman 1992	Hausman 1992
	Friedman 1953	McCloskey 1985	Friedman 1953	Friedman 1953
	McCloskey 1985	Blaug 1962	Hands 2001	Reiss 2012
	Blaug 1962	Friedman 1953	Hutchison 1938	Robbins 1935
	Robbins 1935	Rosenberg 1993	Blaug 1962	Hands 2001
Small m	Haavelmo 1944	McCloskey 1985	Haavelmo 1944	Deaton 2010
	Hoover 2001	Mirowski 1989	Hoover 2000	Haavelmo 1944
	McCloskey 1985	Cooley 1985	Hendry 1995	Pearl 2001
	Pearl 2001	Engle 1987	Hoover 2001	Spirtes 2000
	Spirtes 2000	Gilbert 1986	Kuhn 1962	Hoover 2001
Decision Theory	Keynes 1936	Keynes 1936	Hollis 1998	Soros 2013
	Luce 1957	Binmore 1987	Keynes 1921	Bacharach 2006
	Pearce 1984	Selten 1975	Keynes 1936	Keynes 1936
	Aumann 1976	Aumann 1976	Lewis 1969	Mackenzie 2008
	Lewis 1969	Bernheim 1984	Bernheim 1984	Schelling 1960

Table 1: Most cited documents per cluster in the corpus of Specialized Philosophy of Economics. Only first authors are printed.



(a) Top 10 most distinctive phrases (tf-idf) per cluster in the title of articles



(b) Article share of clusters over time (smoothed using local polynomial regression)

Figure 2: Clusters detected in the corpus of Specialized Philosophy of Economics.

Kahneman and Tversky (1979) is the most cited document by this cluster. There are also many references to seminal papers in microeconomics like Allais (1953) or Savage (1954).

**Big M** ( $n = 215$ ): Articles in this cluster are typically about general concerns such as realism, abstraction, explanation, and the scientific nature of economics.<sup>11</sup> This cluster cites extensively scholars that are close to the INEM such as McCloskey (1985), Blaug (1992), Hausman (1992), Hands (2001) and Reiss (2012). These references are mixed with seminal methodological contributions by economists such as Robbins (1935) and Friedman (1953).

**Small m** ( $n = 91$ ): Methodological issues discussed in this cluster relate to causal inference, econometrics, statistical significance, evidence, and prediction. It is the smallest cluster overall. Like with Big M, some of its most cited documents are from scholars close to the INEM such as McCloskey (1985),<sup>12</sup> and Hoover (2001). Its other highly cited documents are contributions to techniques of statistical and causal inference (e.g., Haavelmo, 1944; Pearl, 2000; Deaton, 2010).

**Decision Theory** ( $n = 193$ ): This cluster focuses on philosophical issues related to decision theory (including game theory). One initially surprising property is that Keynes's *General Theory* (1936) is the most cited document by this cluster. Looking more closely, we find that most articles citing this foundational book in macroeconomics do not focus on Keynes's macroeconomics, but rather on its underlying theory of human behavior.<sup>13</sup> The other highly cited documents are mostly classics in game theory such as Luce and Raiffa (1957), Aumann (1976) and Pearce (1984). Lastly, another initial surprising property is the presence of (George) Soros in the cluster's keywords and in the most cited authors in the last decade. This property is explained by the publication in 2013 of a special issue about Soros's theory of human reflexivity in the *Journal of Economic Methodology*, with 13 comments replying to Soros's lead article.

After having described briefly each cluster, we can note various changes over the period (see Figure 2b). First, two clusters have become more peripheral to the specialty since the 1990s: Big M and Decision Theory. After its peak of popularity in the mid 1990s at approximately 34% of all publications, Big M has steadily declined, to represent around 16% of publications in Specialized Philosophy of Economics at the end of the period. The declining presence of Decision Theory from 35% to around 7% is even more dramatic. Second, Behavioral Economics stands out as a recently popular cluster: its share of yearly publications climbed quickly from 2005 to 2010 and has stayed relatively high since then. Finally, two

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<sup>11</sup>For the inspiration for the label, see Section 4.2.2.

<sup>12</sup>McCloskey's book is the only top reference shared by Big M and Small m.

<sup>13</sup>See Section 3.3.1 in our Technical Appendix for the full list of articles. For instance, the earliest article citing the *General Theory* is titled 'Keynes's Theory of Probability and Its Relevance to His Economics: Three Theses' (Cottrell, 1993) and a more recent article is 'Conventionalism, Coordination, and Mental Models: From Poincaré to Simon' (Koumakhov, 2014).

clusters exhibit no uniform trend: Moral Philosophy and Small m. The share of the first cluster fluctuates significantly, but remains high overall, averaging at 29% for the period. In contrast, Small m has fluctuated around a lower average share, just below 10%.

#### 4.1.2 Discussion

The clusters detected in Specialized Philosophy of Economics map onto standard characterizations of the field. In the Stanford Encyclopedia of Philosophy, Hausman begins the entry “Philosophy of Economics” with the following division:<sup>14</sup>

“Philosophy of Economics” consists of inquiries concerning (a) rational choice, (b) the appraisal of economic outcomes, institutions and processes, and (c) the ontology of economic phenomena and the possibilities of acquiring knowledge of them. Although these inquiries overlap in many ways, it is useful to divide philosophy of economics in this way into three subject matters which can be regarded respectively as branches of action theory, ethics (or normative social and political philosophy), and philosophy of science. (Hausman, 2008)

Before the rise in importance of the Behavioral Economics cluster around 2005, the mapping between Hausman’s typology and our automated detection was simple: Decision Theory was the cluster highly related to action theory, Moral Philosophy was the cluster associated to ethics, and the two other clusters – Big M and Small m – can be interpreted as containing topics related to philosophy of science.

The recent prominence of Behavioral Economics shows how the branches can overlap. We even venture to say that the captivation of philosophers of economics for research in behavioral economics (with neighboring neuroeconomics and experimental economics) can partly be explained by the fact that the three branches can feed on it: action theorists find in this research some material on (ir)rationality, ethicists react to its policy ramifications (e.g., the literature on nudges) and philosophers of science are fond of its claim to renew empirical methods in economics (e.g., with experiments) and to reject the alleged instrumentalism of the modeling culture in economics.

Regarding the evolution of Big M, our results mesh relatively well with the story told by Hands:

[T]he vast majority of the methodological literature of the last decade [...] is not based on grand universalistic philosophy of science; it is applied philosophical inquiry aimed at the practical methodological issues of practitioners within specific subfields and sensitive to the issues, challenges, and constraints they face. (Hands, 2015, p. 76)

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<sup>14</sup>A similar threefold division has been endorsed recently by Campagnolo and Gharbi (2017) and Hédoïn (2018). Scholars that use a more restrictive distinction tend to focus on the philosophy of science branch (e.g., Davis and Hands, 2011; Mäki, 2012; Ross, 2014).

We indeed find a significant decline in Big M since the late 1990s. What is Big M has also changed: its three most distinctive keywords for the last decade are ‘stylized facts’, ‘world models’ and ‘explanation paradox’ (the title of Reiss, 2012), which strongly suggest that the epistemic status of models is what mostly occupies recent scholars in this cluster.

To some extent, our results also corroborate Hands’s point that the attention has turned toward “practical methodological issues,” although the issues that are addressed by contemporary philosophy of economics appear to be primarily associated to behavioral economics. In parallel, the share of articles in the Small m cluster has remained stable. Echoing historical claims about the rise of a pluralistic mainstream in economics (Colander et al., 2004; Davis, 2006), Hands (2015, p. 72) suggests that methodological attention has turned not only toward “neuroeconomics, experimental economics, behavioral economics”, but also toward “evolutionary economics; and the associated new tools such as computational economics, agent-based modeling, and various new empirical techniques.” We do not see such a turn in the cluster of Specialized Philosophy of Economics.

All in all, our results about recent ‘methodological’ work in Specialized Philosophy of Economics corroborate the presence of the three trends put forth in a recent survey by Luis Mireles-Flores:

- (a) the philosophical analysis of economic modelling and economic explanation;
- (b) the epistemology of causal inference, evidence diversity and evidence-based policy and (c) the investigation of the methodological underpinnings and public policy implications of behavioural economics. (Mireles-Flores, 2018, p. 93)

Outside strictly methodological work, the decreasing share of Decision Theory in Specialized Philosophy of Economics is a notable characteristic of our results that appears to have escaped the attention of commentators. Is it that philosophical aspects of decision and game theory have become less studied recently? Evidence points in another direction: this type of work has moved elsewhere – i.e., in other journals than the two included in our corpus. Using the Web of Science, we have tracked citations to Luce and Raiffa (1957), Aumann (1976) and Pearce (1984), the three publications that are most cited by the Decision Theory cluster and are unambiguously classics for decision and game theory.<sup>15</sup> We note first that annual citations to these documents are roughly steady since the 1990s (a combined 90 to 100 citations per year). Second, we find evidence that reflexive or philosophical work citing these sources is getting more common. Indeed, only 4% of citations to these sources in the 1990s came from journals classified as philosophy or science studies. This share was rather 10% in the 2010s. The philosophy journal *Synthese* has been the third most frequent originator of citations to these classics in the 2010s.<sup>16</sup> In short, the philosophical study of decision and game theory is alive and well, but it has become peripheral to the core journals of Specialized Philosophy of Economics.

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<sup>15</sup>See Section 3.4.1 in our Technical Appendix for details of this analysis.

<sup>16</sup>In all decades, *Journal of Economic Theory* and *Games and Economic Behavior* take turns in first and second places. *Synthese* took over the third position to *Theory and Decision* in the 2010s.

## 4.2 JEL Economic Methodology

### 4.2.1 Results

Six clusters are detected when applying the method described in Section 3 to our second corpus of articles. We follow the same procedure to name these clusters (i.e., with Figure 3a and Table 2), keeping the label for some clusters when the parallels are obvious:

**Institutional Economics** ( $n = 500$ ): The most distinctive keyword for this cluster gives its identity away as ‘institutional economics’ (Rutherford, 1994). The cluster leans toward evolutionary economics (Nelson and Winter, 1982), ‘old’ institutional economics (e.g., Veblen, 1919), Keynes (1936) and the pre-1945 history of economics (Smith, 1776; Marshall, 1890; Robbins, 1935). Yet, it also relates to ‘new’ institutional economics – e.g., with citations to Williamson (1985) and North (1990). The publication venues of its articles are diverse, with the *Journal of Economic Issues* (associated to the *Association for Evolutionary Economics*) coming first with only 9%.<sup>17</sup>

**Critical Realism** ( $n = 243$ ): Like the cluster Institutional Economics, the most distinctive keyword for this cluster is the name of a school of thought. The second keyword – ‘Post Keynesian’ – also has an extremely high tf-idf, indicating that our algorithm detects Post Keynesian economics has being tightly knitted with Critical Realism when it comes to methodology. This cluster can be characterized as highly concentrated in two ways. First, almost all the top references are either to Roy Bhaskar (considered the founder of critical realism) or to Tony Lawson (its most famous proponent in economics). Second, 42% of its articles are published in the *Cambridge Journal of Economics*, by far the strongest association between a journal and a cluster in this corpus.

**Political Economy** ( $n = 130$ ): This cluster has a strong Marxian flavor, with keywords such as ‘dialectics’ and abundant references to Marx. It also has some associations with social ontology, with keywords such as ‘collective intentionality’ and references to Searle. Finally, it also discusses social scientific methods that are not extensively used in economics such as case studies – many references go to a textbook on this method (George and Bennett, 2007). Although the cluster might be said to be heterogeneous, it holds together by being mostly about methodological discussions on the study of the economy, but laying outside the borders of economics. Indeed, 60% of the articles in this cluster are published in journals that are not in economics according to the NSF classification – e.g., 22% are in the journal *Science and Society*.

**Big M** ( $n = 329$ ): This cluster has similarities with the cluster that we label identically in the other corpus: it asks the big questions about the status of economics as a science. More specifically, central sources for this cluster are Friedman (1953), some classical sources in philosophy of science (Popper, 1934; Kuhn, 1962), Blaug (1980) as

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<sup>17</sup>For the top sources of articles for each cluster see Section 4.4. in our Technical Appendix.

an interpreter of these sources for economics and McCloskey (1998) as a critic of the use of these sources.

**Small m** ( $n = 111$ ): This is the other cluster that has a corresponding cluster in Specialized Philosophy of Economics. In this case, both clusters focus on methodological issues that are more connected with the day-to-day work of economists. They also take only a small share of the articles. This time, the most cited technical source on statistical inference is Edward Leamer (1978, 1983) and many keywords refer to this topic. The cluster includes discussions of economic theory such as rational expectations (citing Keynes and Lucas) and Piero Sraffa's theory. We note that the *Journal of Economic Perspectives* is its top source of articles, almost tied with the *Cambridge Journal of Economics* since both published 11% of the articles in the cluster. The presence of the *Journal of Economic Perspectives* indicates that some content of this cluster is closer to the mainstream of economics.

**History of Economics** ( $n = 107$ ): This cluster is unique in its emphasis on pre-1940 history of economic thought, with numerous references to classics such as Smith (1776), and Marshall (1890), and heavy reliance throughout the period on Schumpeter, including his *History of Economic Analysis* (1954). Its most important sources of articles are historical journals such as *History of Political Economy* (20%) and the *European Journal of the History of Economic Thought* (14%).

Regarding temporal tendencies, two clusters exhibit extreme changes in their shares of articles (see Figure 3b). First, Critical Realism, starting from almost non existence, grows quickly in the second half of the 1990s, reaches a plateau around 25% of articles in the early 2000s, and then decreases slightly to settle around a fifth of the articles at the end of our period. Second, the share of Big M decreases by 30 percentage points over the period, going from the biggest cluster to a roughly tied position as smallest cluster with Small m and History of Economics.

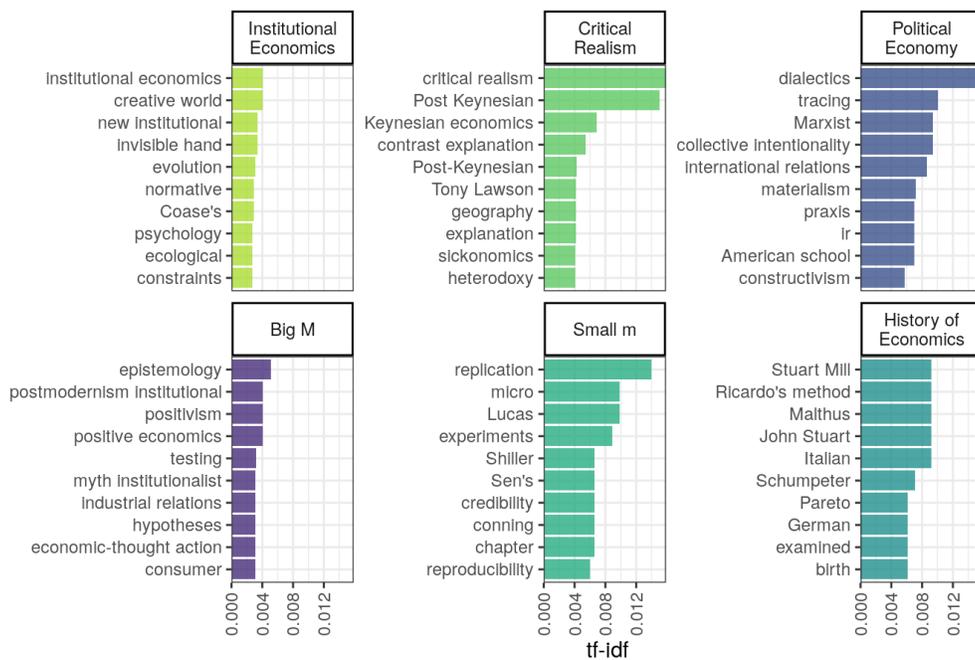
The four other clusters exhibit comparatively mild changes in article shares over the period. Small m and History of Economics are the most stable, with an increase of only a few percentage points over the period. Institutional Economics has experienced a mild downward trend and thus remained the biggest cluster for more than 20 years. Finally, Political Economy had an S-shape progression, finishing the period 10 percentage points higher than where it started.<sup>18</sup>

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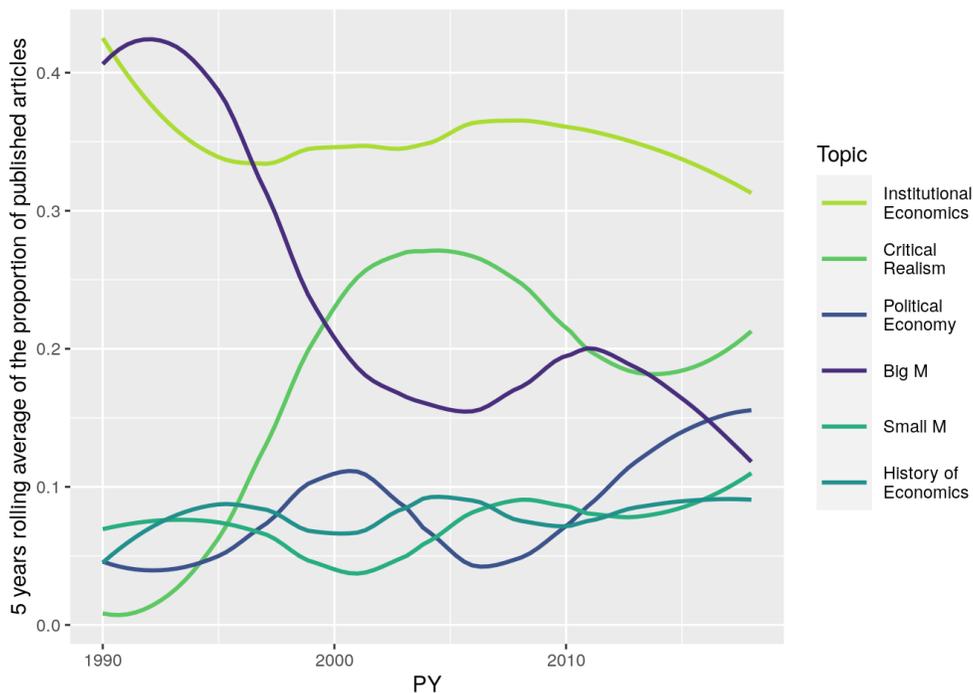
<sup>18</sup>There are also changes in the focus of clusters that can be gleaned from the changes in the most cited documents (Table 2) and by the decade-by-decade changes in keywords and most frequent journal sources (both of these properties are in the Technical Appendix, respectively Sections 4.2.2 and 4.4). Most notably, the heterogeneity of Political Economy discussed above represents a temporal evolution: starting with a Marxian focus in the 1990s, moving on to social ontology in the 2000s and adding discussions of case studies and process tracing in the 2010s.

Cluster	Full period	1990-1999	2000-2009	2010-2018
Institutional Economics	Nelson-R 1982	Nelson-R 1982	Nelson-R 1982	Robbins-L 1935
	North-D 1990	Williamson-O 1985	North-D 1990	North-D 1990
	Robbins-L 1935	Veblen-T 1919	Hayek-F 1948	Smith-A 1776
	Marshall-A 1920	Marshall-A 1920	Robbins-L 1935	Marshall-A 1920
	Smith-A 1776	Williamson-O 1975	Marshall-A 1920	Nelson-R 1982
Critical Realism	Lawson-T 1997	Lawson-T 1997	Lawson-T 1997	Lawson-T 1997
	Lawson-T 2003	Bhaskar-R 1978	Lawson-T 2003	Lawson-T 2003
	Bhaskar-R 1978	Bhaskar-R 1989	Bhaskar-R 1978	Lawson-T 2012
	Bhaskar-R 1989	Lawson-T 1994	Bhaskar-R 1989	Lawson-T 2006
	Fleetwood-S 1999	Bhaskar-R 1986	Fleetwood-S 1999	Bhaskar-R 1978
Political Economy	Searle-J 1995	Marx-K 1970	Searle-J 1995	Searle-J 1995
	Marx-K 1970	Marx-K 1973	Searle-J 1983	George-A 2005
	Marx-K 1973	Ollman-B 1993	Searle-J 1969	Searle-J 2010
	Wendt-A 1999	Hegel-G 1969	Searle-J 1990	Wendt-A 1999
	George-A 2005	Cohen-G 1978	Tuomela-R 1995	King-G 1994
Big M	Friedman-M 1953	Friedman-M 1953	Friedman-M 1953	Friedman-M 1953
	Kuhn-T 1970	Kuhn-T 1970	Kuhn-T 1970	Kuhn-T 1970
	McCloskey-D 1998	McCloskey-D 1998	Popper-K 1968	McCloskey-D 1998
	Blaug-M 1992	Blaug-M 1992	Caldwell-B 1982	Popper-K 1968
	Popper-K 1968	Popper-K 1968	McCloskey-D 1998	Keynes-J 1936
Small m	Leamer-E 1983	Stokey-N 1989	Keynes-J 1936	Leamer-E 1983
	Keynes-J 1936	Davidson-P 1982	Leamer-E 1983	Keynes-J 1936
	Lucas-R 1981	Arrow-K 1971	Sraffa-P 1960	Lucas-R 1976
	Sraffa-P 1960	Keynes-J 1936	Arrow-K 1971	Sims-C 1980
	Leamer-E 1978	Leamer-E 1978	Schwartz-J 1986	Lucas-R 1981
History of Economics	Schumpeter-J 1954	Schumpeter-J 1954	Schumpeter-J 1954	Schumpeter-J 1954
	Marshall-A 1920	Hayek-F 1948	Blaug-M 1985	Keynes-J 1936
	Smith-A 1776	Marshall-A 1920	Blaug-M 1980	Smith-A 1776
	Schumpeter-J 1934	Smith-A 1776	Mill-J 1848	Schumpeter-J 1934
	Schumpeter-J 1950	Becker-G 1976	Hayek-F 1967	Marshall-A 1920

Table 2: Most cited documents per cluster in the corpus of JEL code 'Economic Methodology'



(a) Top 10 most distinctive phrases (tf-idf) per cluster in the title of articles



(b) Article share of clusters over time (smoothed using local polynomial regression)

Figure 3: Clusters detected in the corpus based on the JEL code 'Economic Methodology'.

### 4.2.2 Discussion

How does JEL Economic Methodology compares to Specialized Philosophy of Economics? We find some similarities, but also some striking differences.

We already tried to attract attention to the main similarity between the corpora by naming two clusters identically in each of them: Small  $m$  and Big M. These labels refer to McCloskey’s distinction between “the workaday utility of method with a small  $m$ ” and “Methodology” with a capital M, which asks big questions about the status of economics as a science (McCloskey, 1998, p. 160; see also Hands, 2001, p. 255).<sup>19</sup> The Big M clusters in each corpus engage extensively with Friedman’s 1953 essay, with Blaug’s Popperian interpretation of economics and with McCloskey’s criticism of the big questions. Both clusters also see their relative importance diminish significantly between the 1990s and the late 2010s, which indicates that the relative disinterest for Big M already documented in Specialized Philosophy of Economics (Hands, 2015) extends to the other economic methodology. With respect to the two Small  $m$  clusters, they both cover issues related to statistical inference. Furthermore, both have a low share of the articles.

Yet, even Big M and Small  $m$  exhibit dissimilarities across corpora. In Specialized Philosophy of Economics, the most cited document by a large margin in Big M is Hausman’s *Inexact and Separate Science* (1992), but it is little cited in JEL Economic Methodology. Other scholars associated with INEM, such as Hands and Reiss, follow the same pattern: important in Specialized Philosophy of Economics, but of minor relevance in JEL Economic Methodology. Big M in JEL Economic Methodology stays closer to philosophical classics such as Popper and Kuhn. Furthermore, Big M in JEL Economic Methodology did not follow the path through time of its homologous cluster toward a focus on the scientific status of models.

The two Small  $m$  clusters have also mostly a surface similarity. Even the challenges of statistical inference are treated differently: in Specialized Philosophy of Economics, it is strongly connected to philosophy of causality with extensive citations to Haavelmo (1944), Pearl (2000), Spirtes et al. (2000) and Hoover (2001), while the key inspiration for JEL Economic Methodology is Leamer’s approach (1983) to sensitivity testing. In addition, discussions of Lucas’s rational expectations and of Sraffa’s neo-Ricardian economics figure prominently only in the Small  $m$  of JEL Economic Methodology. One hypothesis that would explain this different focus is that specialized philosophers of economics face incentives to make interdisciplinary connections, which are easy with causality but less obvious for theories such as Lucas’s and Sraffa’s that are native to economics.

When we look at the other clusters, the differences between the two corpora grow even bigger. No cluster in the JEL corpus is associated to the philosophical topics of “action theory” and “ethics (or normative social and political philosophy)” (Hausman, 2008). In this sense, ‘Economic Methodology’ as a JEL code is more restrictive than influential delimitations of ‘philosophy of economics’: it is, as its name suggests, focused on the third subject matter in Hausman’s typology, the one associated to philosophy of science. Obviously, this

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<sup>19</sup>Although McCloskey used the label to criticize Big M, our borrowing of terms does not imply that we share McCloskey’s opinion on the relative value of each type of inquiry.

focus does not imply the absence of sustained discussions of action theory and ethics in journals covered by EconLit beyond JEM and E&P. As we already hinted at in section 4.1.2, our corpus of Specialized Philosophy of Economics has no monopoly over foundational issues in decision and game theory and a similar point holds for the ethics and political philosophy of economics. However, economics, through the JEL codes, is not structured such that it is easy to individuate work strongly related to these subject matters. They are dispersed in the JEL hierarchy under headings such as:<sup>20</sup>

- A13 Relation of Economics to Social Values
- C70 Game Theory and Bargaining Theory: General
- D01 Microeconomic Behavior: Underlying Principles
- D6 Welfare Economics

It is flagrant that the negotiations inside the economics profession that have defined and updated the JEL codes (Cherrier, 2017) are not conducive to clearly delineate the subject matters of Specialized Philosophy of Economics.

What our results indicate is rather the strong association of JEL Economic Methodology with heterodox approaches and with the history of economic thought. Heterodox approaches are central to three clusters: Institutional Economics, Critical Realism and Political Economy. And we have a cluster History of Economics. None of these orientations are prevalent in Specialized Philosophy of Economics. JEL Economic Methodology thus reflects extremely strongly the hierarchy of the current JEL classification which puts ‘B4 Economic Methodology’ under ‘B. History of Economic Thought, Methodology, and Heterodox Approaches.’ As a result, JEL Economic Methodology also shows little interest in what has boomed in Specialized Philosophy of Economics: the cluster Behavioral Economics.<sup>21</sup>

These results put in perspective a general narrative about the philosophy (or methodology) of economics. According to this narrative, the philosophy of economics has not only moved away from Big M, it has also left behind the divide between neoclassical and heterodox economics:

The bottom line is that almost all of the real ‘action’ within contemporary economic methodology is in precisely [...] elements of the new, more pluralistic, mainstream [...]. Neoclassicism may not be dead, but it is no longer the focus of the cutting edge of methodological research – but then nor is heterodox economics. Neither neoclassical nor heterodox economics are the main focus of recent methodological inquiry. (Hands, 2015, p. 72)

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<sup>20</sup>Note also that most methodological discussions are also not classified with the JEL code ‘Economic Methodology’ (B4 since the early 1990s). For instance, there is ‘C1 Econometric and Statistical Methods and Methodology: General’.

<sup>21</sup>As a clear indicator of the disparity, we can take citations to Kahneman: his *Econometrica* (1979) article with Tversky is the 7th most cited in Specialized Philosophy of Economics, but only 45th in the JEL Economic Methodology corpus. The gap is huge with his recent *Thinking, fast and slow* (Kahneman, 2011): 44th versus 638th. See Section 2.4 in the Technical Appendix for more comparisons.

This narrative is a neat example of boundary-work (Gieryn, 1983) internal to science. According to our study, it is a proper characterization of the field of Specialized Philosophy of Economics – a field that Hands has contributed to structure as co-editor of the *Journal of Economic Methodology*. However, it leaves out much of what occurs in JEL Economic Methodology: for better or worse, a significant part of articles labeled ‘Economic Methodology’ still takes heterodox economics to be “real ‘action’”.

## 5 Conclusion

What is philosophy of economics? Our investigation leads us to the conclusion that there has been, in the last 30 years, at least two quite distinct philosophies of economics.

The field of Specialized Philosophy of Economics used to be well depicted by the threefold distinction between ethics & economics, action theory and philosophy of science (Hausman, 2008), with the further precision that philosophy of science can either ask vast questions about the scientific character of economics or more narrow questions about methodological challenges of economics – Big M versus Small m (McCloskey, 1998, p. 160). With the sudden and massive rise in interest for behavioral economics and similar approaches (experimental economics, neuroeconomics) around 2005, the map has changed. In the last few years, Specialized Philosophy of Economics is divided between a still strong ethics & economics cluster (that we call Moral Philosophy in Section 4.1) and three other subject matters: models & explanation (in Big M), causal inference (in Small m) and behavioral economics.

The other philosophy of economics, the one corresponding to JEL Economic Methodology, is strongly associated to criticisms of ‘mainstream economics’ (with three clusters: Institutional Economics, Critical Realism and Political Economy) and with pre-1945 history of economic thought (cluster History of Economics). It has clusters that can be paired with Big M and Small m in the other corpus, but the pairs are far from identical twins.

The interpretive literature that we surveyed in our two discussion sections (4.1.2 and 4.2.2) overlooks the important differences between these two philosophies of economics. A perspective informed by the sociology of science can easily explain this neglect: the interpretations are written by and for members of the specialized field, those that belong to Specialized Philosophy of Economics. One value of the more data-driven approach used in this chapter is to remind members of a scientific field that, although they have delineated a region for themselves, what they have excluded does not necessarily go extinct.

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