

# GENDER HOMOGENEITY IN PHILOSOPHY AND METHODOLOGY OF ECONOMICS: EVIDENCE FROM PUBLICATION PATTERNS

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# Gender Homogeneity in Philosophy and Methodology of Economics: Evidence from Publication Patterns

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## Abstract

This study examines gender diversity among authors in philosophy and methodology of economics, comparing it to the disciplines of economics and philosophy. Using bibliometric methods, we find that philosophy and methodology of economics, as an interdisciplinary field, consistently had a lower share of women authors than its parent disciplines, which are the two social sciences and humanities disciplines that are the furthest from gender parity. Although homogeneity compounding generally characterizes the whole field of philosophy and methodology of economics, one small and temporary subfield, making contributions to heterodox economics, structural realism, and the discussion on pluralism in economics, constituted a pocket of gender diversity. Alongside a more general discussion of possible reasons behind the striking gender imbalance in the field, we also elaborate on possible reasons for the limited size and duration of this pocket of diversity.

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# 1 Introduction

Gender diversity in science has been under a lot of quantitative scrutiny over the last two decades. A recurring focal point is gender representation within and across disciplines, whether in terms of citations, salaries, publications, faculty positions, or PhD trajectories (Chan and Torgler, 2020; De Nicola and D’Agostino, 2021; Gaughan and Bozeman, 2016; Larivière et al., 2013; Samaniego et al., 2023). Recent studies have also focused on the interaction between gender and interdisciplinarity. While interdisciplinary research can lead to more grants and be an opportunity for innovative and more impactful research (Chen et al., 2015), it is also a risky career choice that women may be advised to avoid early in their careers. Indeed, Liu et al. (2023) find that the doctoral theses of women tend to be less interdisciplinary than those of men. Regarding scientific publications, empirical results point in the other direction: the presence of women is positively associated with interdisciplinarity (Pinheiro et al., 2022), although this tendency might not hold in some fields such as biology (Pfirman and Laubichler, 2023).

While studies on gender diversity generally use large disciplinary categories (e.g., humanities, chemistry, STEM fields), this article investigates gender diversity in a relatively small interdisciplinary field, namely philosophy and methodology of economics. The labels ‘philosophy of economics’ and ‘economic methodology’ refer to research concerned with foundational and reflexive issues surrounding economics, which is thus undertaken at the crossroads between two academic disciplines: economics and philosophy.

Contemporary economics and philosophy have, perhaps surprisingly, much in common. Scholars who straddle the two disciplines tend to emphasize commonalities that they deem positive (such as an emphasis on conceptual clarity, an interest in well-being, and an understanding of human rationality and its implications). However, recent research on the sociodemographics of the scientific community puts economics and philosophy under the same spotlight for less enviable characteristics: their relatively low diversity on various dimensions, including gender (Bayer and Rouse, 2016; Thompson, 2017). In 2015, these disciplines had the lowest percentage of women among U.S. Ph.D. recipients in the social sciences and humanities (Leslie et al., 2015, p. 263). Regarding the percentage of women authorships over the period 2008-2020, economics ranks last in the social sciences and philosophy holds the same title for the humanities (Sugimoto and Larivière, 2023, p. 19).<sup>1</sup>

The question we address in this paper is how philosophy and methodology of economics as a field compares to the two disciplines that it straddles in terms of gender diversity. So far, there is no systematic study of the gender diversity of this field. Furthermore, no study has focused on interdisciplinary fields that are at the crossroads of two disciplines that both have a gender distribution strongly skewed against women. The limited evidence suggests that interdisciplinary fields attract more women than its parent discipline with the lowest women share – e.g. computer science in the case of bioinformatics (Genut and Kolikant, 2023). However, this result holds for an interdisciplinary field with parent disciplines having

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<sup>1</sup>Both are also disciplines with a strong focus on intellectual traditions, themes, and issues tightly connected to Western countries (see Van Norden, 2019 for the Eurocentrism of philosophy and Frey and Pomrehne, 1984 for the US domination in economics).

very different gender distributions – biology having a significantly higher share of women contributors than computer science. In the absence of comparable research, we propose two contrasting hypotheses to give a direction to our study:

**Homogeneity Compounding Hypothesis:** Philosophy and methodology of economics is even less gender diverse than either economics or philosophy.

**Pocket-of-Diversity Hypothesis:** Philosophy and methodology of economics is more gender diverse than either economics or philosophy, perhaps reaching levels of gender diversity comparable to the social sciences and humanities in general.

Various mechanisms could explain the resulting distributions. Let us illustrate two possibilities with sequential sorting. The tree-like structure of disciplines and specialties is an enduring social feature of modern science (Hagstrom, 1965; Whitley, 2000). Disciplines typically represent the entry point in academia (undergraduate degrees), while specialties correspond to contemporary divisions of research at the graduate level. Economics and philosophy are the two major entry points leading to a later specialization in philosophy and methodology of economics. The first sorting step is common to the Homogeneity Compounding and the Pocket-of-Diversity Hypotheses: some sociodemographic groups (e.g., women) are underrepresented in undergraduate economics and philosophy (Lundberg, 2018; Paxton et al., 2012), with some evidence of grading bias by gender in economics starting at the undergraduate level (Jansson and Tyrefors, 2022) and a strong suspicion that philosophers’ extreme emphasis of “brilliance” feeds gender stereotypes in philosophy courses (Muradoglu et al., 2023).

From these distributions at the undergraduate level, a specialization in philosophy and methodology of economics in the second step could be even less likely to be selected by members of underrepresented sociodemographic groups because it requires building bridges with another discipline with a similarly low level of diversity. This tendency would lead to homogeneity compounding. Just as with interdisciplinarity work, women economists might be encouraged to avoid risky research ventures, such as engaging with a new discipline, and to favor traditional career paths (Liu et al., 2023), especially because they are already a minority in economics (Liu et al., 2020).

Alternatively, philosophy and methodology of economics could be especially interesting to women because much of it engages in a reflexive study of what economists are doing, thus allowing a space to discuss and criticize the social structure of disciplines among like-minded scholars. This attraction, coupled with the general tendency of women to engage in interdisciplinary research (Pinheiro et al., 2022), could result in philosophy and methodology of economics being a pocket of diversity.

In the following, we use bibliometric methods to assess both hypotheses. We find that the Homogeneity Compounding Hypothesis is strongly supported. However, we find that one subfield, that of heterodox economics, has been a pocket of diversity. We discuss various possible factors potentially explaining the situation while noting that the field is changing, which implies that homogeneity compounding need not persist forever.

## 2 Data and method

### 2.1 Corpora

We use two corpora to represent philosophy and methodology of economics, which we will shorten to ‘philosophy of economics’ hereafter:<sup>2</sup>

**Specialized Philosophy of Economics** is our main corpus. It is composed of all articles in Scopus published in the two main field journals: *Economics and Philosophy* (E&P; first volume in 1985, 588 articles in total up to 2022) and the *Journal of Economic Methodology* (JEM; first volume in 1994, 599 articles in total up to 2022).<sup>3</sup> This corpus captures philosophy of economics understood as a relatively autonomous field with its learned societies (most prominently, the International Network for Economic Method, abbreviated INEM), institutes, undergraduate and graduate programs, specialized journals, and handbooks.

**Wider Philosophy of Economics** is composed of all articles in Web of Science published in some philosophy journal (excluding E&P and JEM) and citing at least 3 economics documents. This corpus captures a philosophy of economics with blurrier boundaries. It is a subfield in philosophy, much like philosophy of biology and other philosophies of special sciences. Publications in this corpus tend to appear in more generalist philosophy and philosophy of science journals (e.g., *Synthese*, *Philosophy of Science*). See section 4.1 of our Online Appendix for more details, justification and test on the quality of the corpus.

The temporal distribution of articles from these two corpora is in Figure 1. We see a jump for specialized philosophy of economics in 1994, when JEM begins publication. Wider philosophy of economics has a size similar to specialized philosophy of economics in the late 2000s.<sup>4</sup> As we should expect, it grows much faster than specialized philosophy of economics: the overall number of scientific articles increases with time, but the size of specialized philosophy of economics as we represent it is constrained by the number of articles that can be published in the two main field journals.<sup>5</sup>

Although there could be other ways to carve out a corpus representing philosophy of economics, we contend that our two corpora are adequate to characterize the gender distri-

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<sup>2</sup>Shortening the expression is not inconsequential because ‘philosophy of economics’ and ‘economic methodology’ carry different disciplinary identifications. By shortening the expression, we anticipate a point in our discussion below: although the field has two disciplinary origins, it has grown to be tilted, at an institutional level, toward philosophy.

<sup>3</sup>These journals are identified as central to philosophy of economics by Hausman (2021, sec. 4), Mäki (2012, p. xv) and Hands (2015, p. 62).

<sup>4</sup>We start this corpus in 2007 because of an earlier lack of systematic first names in Web of Science.

<sup>5</sup>Alternatively, we could have attempted to include more journals in specialized philosophy of economics as time went by. However, the changing composition in the list of journals would have generated interpretive challenges. We also note that none of the more recent field journals (*Erasmus Journal for Philosophy and Economics*, *The Journal of Philosophical Economics*, *Economia...*) has made it into Web of Science so far. Consequently, they are not included in wider philosophy of economics as we represent it.

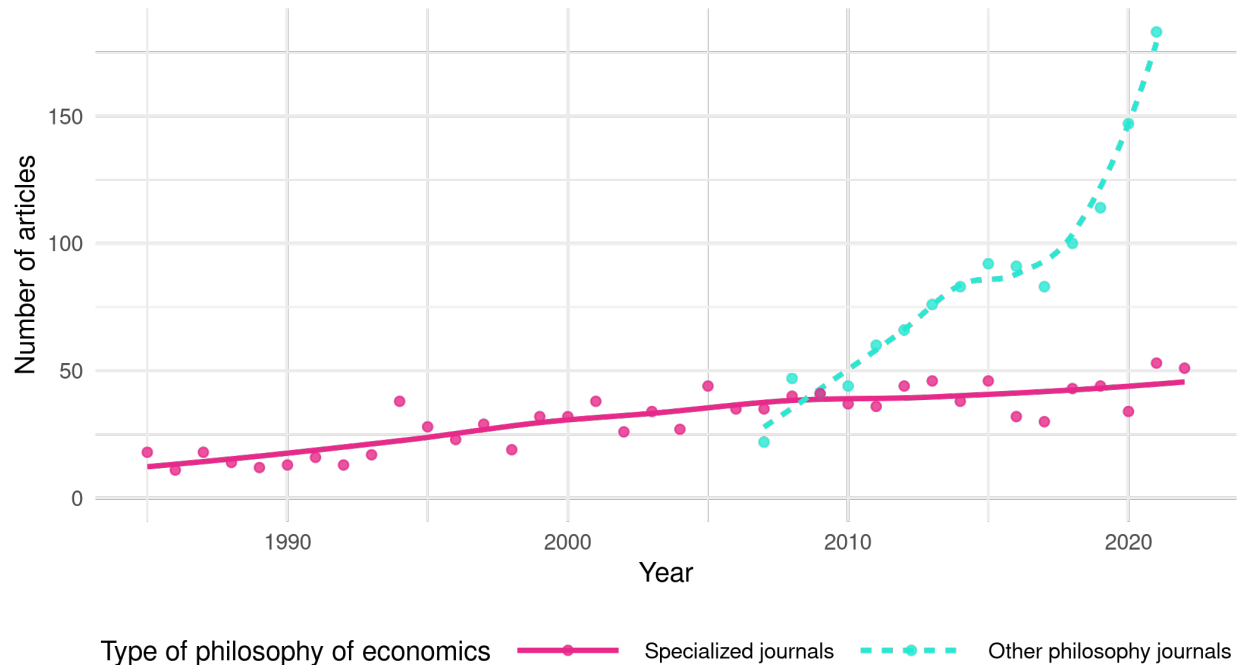


Figure 1: Annual number of articles published in the two corpora representing philosophy of economics

bution of authorship in the field. More specifically, specialized philosophy of economics is our main corpus because it captures a key aspect of an established scholarly field: having dedicated journals. Wider philosophy of economics is mainly useful to test whether, for possible reasons to be discussed below (see section 4), gender is correlated with the tendency to aim at publishing contributions in philosophy of economics in more general philosophy journals.

In addition to these two philosophy of economics corpora, we have two disciplinary corpora for economics and philosophy respectively as separate fields to draw comparisons:

**All Economics** is composed of all articles from Web of Science published in an economics journal according to the National Science Foundation (NSF) classification.

**All Philosophy** is composed of all articles from Web of Science published in a philosophy journal according to the NSF classification.

For all corpora, we focus on documents that are classified as articles, thus excluding some types of documents such as those classified as book reviews or as 'editorials'. The classification of document types performs well, but not perfectly. For instance, introductions to special issues are either classified by the editors as articles or editorials. We used the classification from the databases without performing any re-classification.

## 2.2 Variable construction

The first important treatment on our corpora involves identifying authors' genders. Using Larivière et al.'s (2013) large database of researchers' gendered first names, we first assign a gender to authors based on probability considerations. For a first name associated with a specific gender at least 80% of the time, an author in our corpora with that name is assigned the respective gender. As an additional step for our main corpus (specialized philosophy of economics), we manually checked the gender of authors who appear at least 3 times and assigned ourselves a gender when an error was identified. We used self-assigned pronouns on web pages in this validation process. While this additional step was not undertaken for other corpora due to the high number of authors, a manual verification on random samples was performed to ensure that the probabilistic gender attribution behaved as expected.

Note that this gender assignment is binary, with around 7% of first names with no gender assigned, mostly because they do not reach the threshold of being associated to one gender at least 80% of the times in the database. Furthermore, our procedure does not take into account non-binary gender identification and it captures gender transition only to the extent that the author's first name changes to reflect the new gender identity. First names with no assigned gender are removed from our corpus before the analysis, so that the proportions of women and men artificially sum to one. Binary gender assignment is a limitation of our empirical procedure. To study other gender identities, wesurveys with gender self-identification would be necessary.

Gender identification through first names also imposes constraints on the period covered. Although Scopus has first names since the original volume of the two field journals (1985 for E&P and 1994 for JEM), our three other corpora from Web of Science have reliable first names instead of initials only since 2007.

A second important treatment on our corpora consists in using network analysis to identify research specialties. For specialized philosophy of economics, we constructed a dynamic network to capture the evolution of the field, in a manner similar to Claveau et al. (2021) and Truc et al. (2021). We first built dynamic bibliographic coupling networks with 10-year overlapping windows (2000-2009, 2001-2010...). In a bibliographic coupling network, nodes are articles in the corpus, and the edge (link) between any two nodes captures the extent to which the two articles cite the same references. To identify the most significant edges between articles, the bibliographic networks were built using stochastic degree sequence model backbone extraction (Domagalski et al., 2021). Simply put, backbone extraction creates a simplified version of a network by keeping only the most relevant edges. It is an alternative to weighing edges that is particularly useful for networks with some homogeneity as it helps highlight the main structural features of the network (e.g., clusters; Shen et al., 2019).

We then used the Leiden algorithm (Traag et al., 2019) to identify relevant groups of articles within each network. To track clusters over time, we used the dynamic cluster analysis function of the R networkflow package proposed by Goutsmedt and Truc (2021). This function groups clusters with a high proportion of identical nodes across time windows.

Finally, a last network analysis treatment was performed on our corpora for economics and for philosophy, with the same goal of identifying specialties for each discipline (e.g.,

microeconomics, macroeconomics). The main difference for these larger corpora is that we used (1) smaller time windows of 5 years; and (2) a simple edge weight method rather than backbone extraction (which proved computationally too demanding for the largest corpus). For an elaboration of our approach, see the technical appendix.

### 3 Results on gender distribution

We present our results in four sections: first, the overall gender distribution for the two main journals specialized in philosophy of economics; second, the extent to which specialties inside philosophy of economics have different gender distributions; third, the contrast regarding gender distribution between specialized philosophy of economics and its two parent disciplines, i.e., economics and philosophy; and fourth, the same comparison with wider philosophy of economics.

#### 3.1 Specialized philosophy of economics



Figure 2: Share of women authorships in the two main journals of philosophy of economics

Philosophy of economics is characterized by a very strong gender imbalance (Figure 2). For instance, the first three volumes of E&P (from 1985 to 1987) were entirely composed of men authors. This complete homogeneity recurs through time, such as the 1997 volume



of the JEM<sup>6</sup> and the 2000, 2012 and 2022 volumes of E&P. Proportions over longer periods also demonstrate this extreme imbalance: from 1994 to 2000, less than 8% of authors were women, a proportion which only reached 15% in the last decade of our corpus (2013-2022), still very far from parity. Overall, both journals follow a slightly increasing trend for the share of women. The last year in our corpus (2022) is an outlier, with the share of women dropping back to vanishingly small numbers (4.5% for both journals combined, and a men-only volume for E&P).

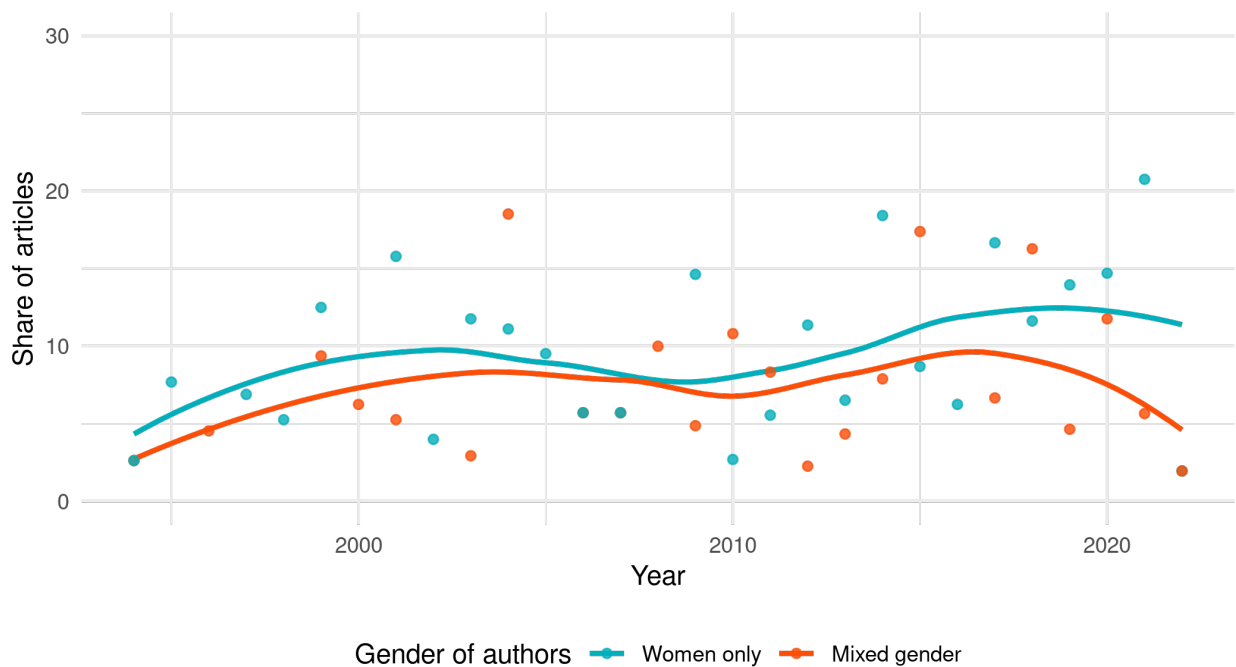


Figure 3: Share of articles with only women authors or mixed gender authors in the two main field journals

The slight increase in the proportion of women authors in recent years results both from an increasing number of women-only articles (solo or in collaboration with other women) and mixed-gender articles (Figure 3). This trend is clear until the end of the 2010s, but the last two years (2021-2022) in our corpus generate significant noise. Indeed, women-only articles reach an all-time high in 2021 (20.8%) before collapsing in 2022, when men-only articles reach their all-time high (96.1%). Although COVID-19 must have played a role here, as it affected women’s contribution to science, these results show how quickly the field can revert to its original extent of gender imbalance.

In addition to the observed gender imbalance in the number of authorships in the past decades, the data reveal a disparity in publication intensity, with some men publishing ver high number of articles in these two journals from 1994 to 2022. Scholars such as Robert

<sup>6</sup>the 2002 volume is also a men-only volume for original articles, but Esther-Mirjam Sent introduced the special issue, which is counted as an editorial in our database.

Sugden (23 articles) and Daniel Hausman (17 articles) are highly visible in the field in terms of their number of their publications. In contrast, the woman with the highest number of articles in those two journals is Julie Nelson, with 6 articles.

This absence of women with a very high number of publications in the two journals could simply be due to the fact that the number of women (125 authors) is far smaller than the number of men (762 authors). Hence, even if the underlying distributions of publication intensity are identical, it could be that a woman with a very high publication intensity has not materialized yet.

We tested this hypothesis with a Monte-Carlo experiment. Sampling 10,000 times 125 authors from the set of men authors, we find that only 9.7% of these samples have a most productive author with no more than 6 articles (see our Online Appendix, section 2.1.2). At a significance level of 10% (but not at 5%), we could thus reject the hypothesis that the absence of women authors with more than 6 articles in the two field journals is due to the fact that they are 6 times fewer than men in these journals. Irrespective of the reason why this discrepancy occurs among high intensity authors, the outcome is that no woman in the field has high visibility thanks to the sheer amount of her publications in the two main field journals.

### 3.2 Disaggregating specialized philosophy of economics

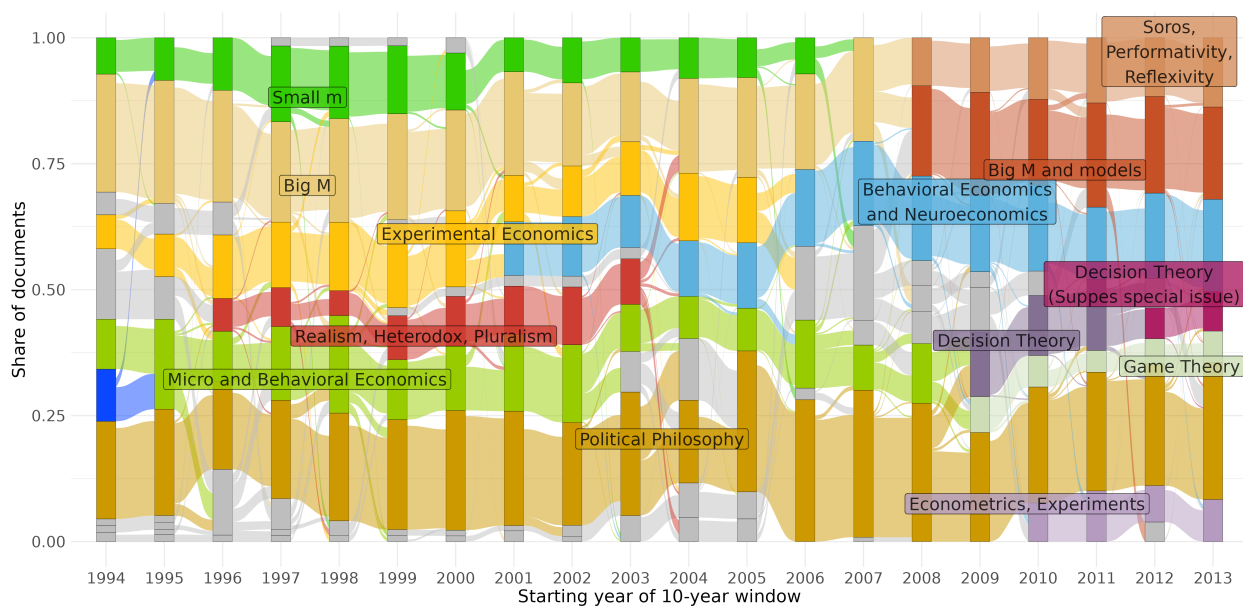


Figure 4: Evolution of clusters in philosophy of economics

The main clusters detected inside specialized philosophy of economics are represented in the alluvial in Figure 4. Since our results are very similar to those of Claveau et al. (2021) and Truc et al. (2021), we reuse part of their terminology to name the clusters (see

section 2.2 of our Online Appendix for more information on the clusters). Although studying the divisions inside specialized philosophy of economics has value in itself, the main purpose of the cluster modeling in the context of this article is to analyze which clusters have more or less gender diversity.

Table 1: Over/under-representation of women authors in the main clusters of philosophy of economics. A positive value signals that the cluster has a higher share of women authors than the field average in the relevant time windows.

<b>Cluster name (and size)</b>	<b>Mean women share difference</b>
Realism, Heterodox, Pluralism (n=212)	0.18
History (n=25)	0.04
Game Theory (n=149)	0.04
Decision Theory - Suppes special issue (n=61)	0.03
Econometrics, Experiments (n=148)	0.03
Behavioral Economics and Neuroeconomics (n=865)	0.01
Political Philosophy (n=1 649)	0.00
Big M and models (n=515)	-0.00
Micro and Behavioral Economics (n=701)	-0.01
Small m (n=421)	-0.01
Big M (n=928)	-0.01
Experimental Economics (n=468)	-0.02
Soros, Performativity, Reflexivity (n=311)	-0.02
Decision Theory (n=183)	-0.04

We focus on the 14 clusters that span at least two time windows. In table 1, we order these clusters by the difference between their share of women authors and the average share for the windows where each cluster is present. A single cluster stands out sharply: the one labeled ‘Realism, Heterodox, Pluralism’ has a women share around 30%, which places it 18 percentage points above the average women share during its lifetime (1995-2004 to 2003-2012). At the other end of the spectrum, the cluster labeled ‘Decision Theory’ has the largest negative difference with the average women share: it comes late in the period (lifetime from window 2009-2018 to 2011-2020), but has a women share of only 10%, which places it 4 percentage points below the field’s average.

All the other clusters look much alike in terms of gender distribution: they oscillate between 4 percentage points above and 2 percentage points below the average share of women authors during their own lifetimes. This conformity is even stronger for the biggest clusters – Political Philosophy, Big M and Behavioral Economics and Neuroeconomics – all at no more than one percentage point of the field’s average.

Overall, we can say that the modest increase in the share of women authors since the 2010s did not come from a few clusters attracting significantly more women. To the opposite, after the disappearance of the ‘Realism, Heterodox, Pluralism’ cluster, the women share has had a small variance among clusters of specialized philosophy of economics.

### 3.3 The parent disciplines of philosophy of economics

We found in the previous section that the gender distribution of specialized philosophy of economics is far from parity. It has never been close to 50/50 and its movement toward this distribution is slow, at best. Even in the cluster with the highest concentration of women, they do not account for more than 30% of authors in the journals we analyze. Still, perhaps philosophy of economics does better in terms of attracting and keeping women than the two disciplines it straddles: philosophy and economics.

This section thus compares the gender distributions of specialized philosophy of economics and its parent disciplines. We can only perform this comparison from 2007 to 2021 because our data for the disciplines of economics and philosophy (from Web of Science) do not systematically include first names before 2007 and are incomplete in 2022.

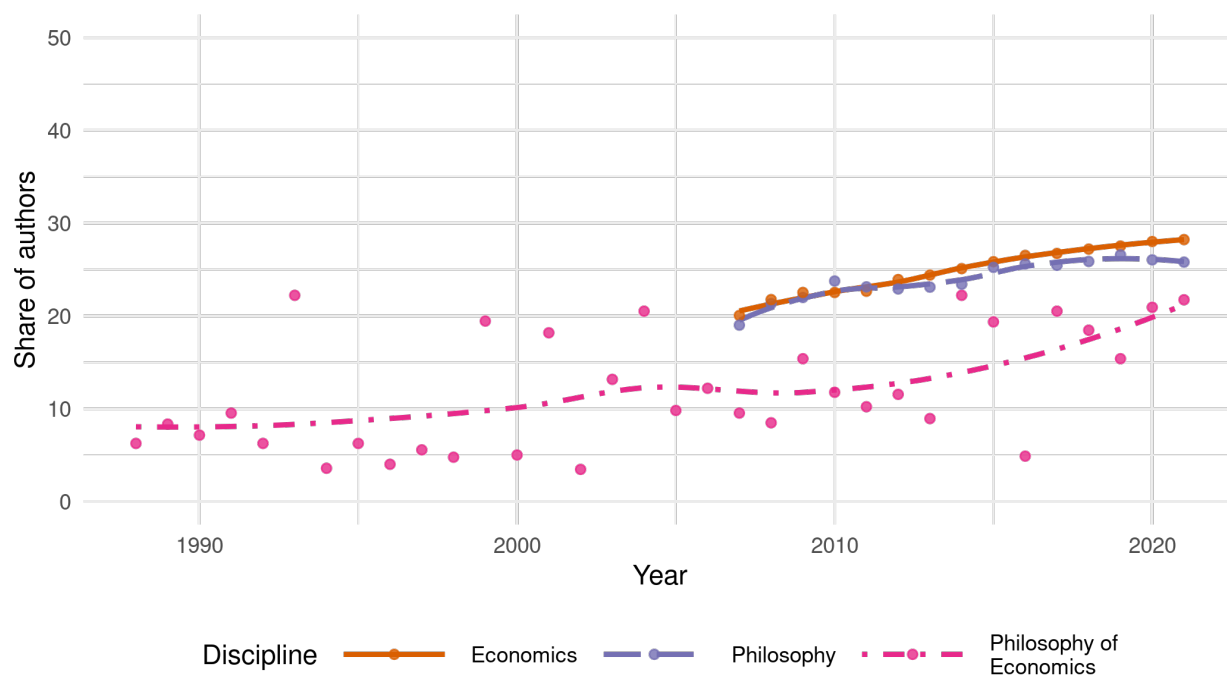


Figure 5: Share of women authors of specialized philosophy of economics compared to the field’s two parent disciplines

Figure 5 shows that economics and philosophy have very similar gender distributions. Over the period under analysis, the share of women authors in economics was 25.5% while it was 24.4% in philosophy. They also follow a comparable upward trend, from around 20% in 2007 to approximately 27% in 2021.

Figure 5 demonstrates that philosophy of economics as a whole is definitively not a pocket of diversity regarding gender. Over the period, the share of women authors is systematically lower in philosophy of economics than it is in both economics and philosophy. Optimists might look at Figure 5 and draw the conclusion that philosophy of economics is, at least,

catching up to economics and philosophy. Indeed, the share of female authors in philosophy of economics went from 11.1% in the first five years of our comparison (2007-2011) to 19.4% in the last five years (2017-2021), an increase of 8.3 percentage points. In contrast, the increase in the share of women authors for economics and philosophy during the same period were respectively 5.6 and 3.9 percentage points.

There are three reasons to moderate this optimism. First, from Figure 5, we see that the small size of specialized philosophy of economics generates much more year-to-year variation in gender distribution compared to economics and philosophy. Hence, results are highly sensitive to the years included in the comparison. If one compares the first *six* years to the last *six* years, the increase in the share of women authors is only 6.3 percentage points, quite close to the increase of 5 percentage points for economics. Second, our comparison omits 2022, which was by far the most men-tilted year of philosophy of economics since 2007. Finally, catching up to economics and philosophy, even if it occurs, would still make it among the laggards in terms of gender parity in the social sciences and humanities.

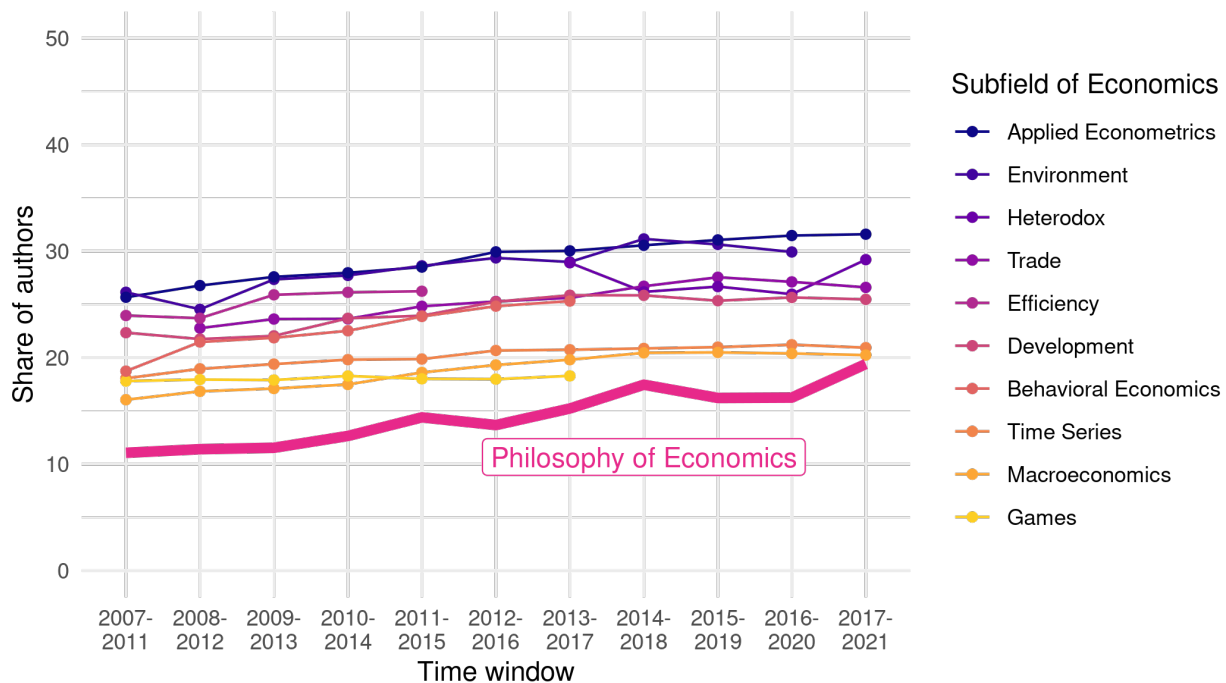


Figure 6: Gender distributions, specialized philosophy of economics compared to specialties in economics

Just like most disciplines of the social sciences and humanities, economics and philosophy are fragmented into a diverse set of specialties. For example, philosophy is made up of a variety of specialties ranging from metaphysics to political philosophy. It is relevant to compare the women share in philosophy of economics to this share in the diverse specialties of its parent disciplines, especially because some specialties can be deemed closer to philosophy of economics than others. For instance, philosophy of science has closer ties to philosophy of

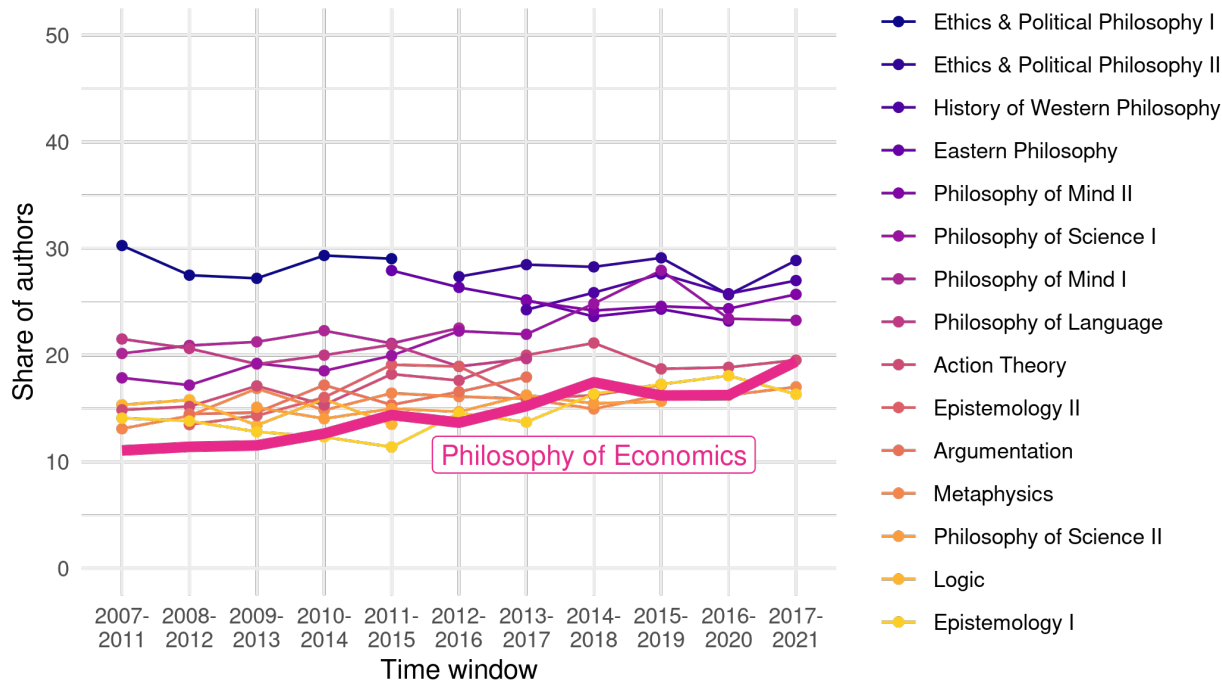


Figure 7: Gender distributions, specialized philosophy of economics compared to specialties in philosophy

economics than Eastern philosophy. To compare them, we have modeled the clusters in each discipline (for the method, see section 2.2 above and our Online Appendix, section 3.1).

Figures 6 and 7 show that philosophy of economics is less diverse than almost all identified specialties in both economics and philosophy. The situation is most striking with economics specialties, where philosophy of economics is less gender diverse than all of them, although it is apparently catching up to the tail of the distribution. A selection of these specialties is now presented in some detail (for more information on the specialties, see our Online Appendix, sections 3.1 and 3.2).

The economics specialty with the highest proportion of women (29.2%) is labeled ‘Applied Econometrics.’ With 15.6% of the articles over the studied period, it is the biggest detected cluster in economics. Typical papers in this specialty use econometrics to analyze cross-section or panel data on microeconomic topics, such as labor, household and education. The keywords that we automatically extract using tf-idf on the article titles are telling: “maternal, children’s, childhood, parental, children, teacher, child, schools, intrahousehold, adult.” This result does not mean that the specialty mostly work on the economics of family and education, but rather the opposite: these topics are mostly tackled in this specialty, such that their lexicon very rarely appear in article titles in other economics specialties.

The specialty labeled ‘Environment’ is the second most gender diverse in economics, with 28.4% of women authors. It is of intermediate size (8.7% of articles) and covers topics such as waste management and climate change. It is followed by a smaller cluster that we labeled

‘Heterodox.’ We detect this cluster only during the last five time windows (2013-2017 to 2017-2021) and it makes up 1.4% of the articles over the full period. This result does not imply that heterodox economics is a very recent creation or that its size is below 2% of economics. To more properly track heterodox economics, we would need other detection techniques. Yet, the fact that the detected cluster has a proportion of 27.4% women authors suggests that heterodox economics more generally is among the most gender diverse specialties in economics.

Turning to philosophy specialties, Figure 7 signals that our detection results are noisier, with more clusters and fewer of them with lives spanning the whole period. Yet, some clear patterns are discernible. The types of specialties with most women authors are those that we labeled ‘Ethics & Political Philosophy’ (two clusters following each other temporally) and the history-oriented clusters: ‘History of Western Philosophy’ and ‘Eastern Philosophy.’ These clusters have proportions of women authors between 25.1% and 28.7%. At the other end of the distribution are types of specialties with the least women authors (between 14.6% and 16.4%): ‘Logic,’ ‘Metaphysics,’ ‘Argumentation’ and two clusters in ‘Epistemology.’ Finally, philosophy of science has two identifiable clusters: the first is associated with the study of mechanisms and biology, the second with the debate on scientific realism and the discipline of physics. Their shares of women authors are markedly different, especially late in the period. When the second cluster is first detected in window 2009-2013, its women share at 15.1% is only 4.1 percentage points behind the other cluster. However, its women share stagnates around 15%, when the share of women authors of the other cluster grows significantly, such that the gap reaches 12.3 percentage points in 2015-2019.<sup>7</sup>

### 3.4 Wider philosophy of economics

Up until now, our results for philosophy of economics concern only the two main field journals (JEM and E&P). This section compares this specialized philosophy of economics to the gender distribution of articles in philosophy of economics, but published in other philosophy journals – i.e., what we call ‘wider philosophy of economics.’ Figure 8 displays the share of women authors in our two philosophy of economics corpora. We have added 0.95 confidence intervals around the trend curves because year-to-year variations are important for both corpora.

Overall, women have been more likely to be authors in wider philosophy of economics than in specialized philosophy of economics. Averaging the difference in women shares over all years of the period, we find a percentage gap of 4.9, which implies that an author in wider philosophy of economics is, on average across the years, 33% more likely to be a woman than in specialized philosophy of economics.

The temporal pattern in Figure 8 adds a layer of complexity: the actual share of women authors in wider philosophy of economics is significantly higher than in specialized philos-

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<sup>7</sup>In the last two time windows (2016-2020 and 2017-2021), the cluster associated to realism and physics is not detected while the size of the other philosophy of science cluster increases significantly. Much of the realism/physics cluster must have been swallowed by the other cluster, which is the most probable reason why the share of women authors of the remaining cluster suddenly drops by 4.6 percentage points.



Figure 8: Share of women authors in the two philosophy of economics corpora. 0.95 confidence intervals are estimated by a generalized additive model with smoothing.

ophy of economics for almost all years up to the last three years of the period, at which point the difference becomes non significant with the order even reversed in the last two years. If we compute proportions over 5-year windows, we find that wider philosophy of economics had, in 2007-2011, a women share of 16.7%, halfway between specialized philosophy of economics (11.1%) and the disciplines of economics and philosophy (both at 22%). In 2017-2021 however, specialized philosophy of economics (19.4%) had almost caught up with wider philosophy of economics (20%) in terms of share of women authors, while economics (27.6%) and philosophy (26%) had augmented their lead.

## 4 Discussion

### 4.1 Homogeneity Compounding with two caveats

**Homogeneity compounding.** Economics and philosophy are disciplines with extreme demographic imbalances in favor of men over women (Paxton et al., 2012; Leslie et al., 2015, p.263; Lundberg, 2018). Does philosophy of economics, as a field at the crossroads of both disciplines, compound this gender homogeneity? Our data on academic publications indicate exactly that: at no point in time since the mid-1980s did women flock to this interdisciplinary field to publish their work. The share of women authors has continually



been lower in philosophy of economics than in either economics and philosophy. Being trained in both economics and philosophy is almost a prerequisite to contributing to philosophy of economics, and apparently there are either fewer women who have this combined training or those with the required education are much less likely than their men counterparts to publish in the specialty.

Our data suggest two caveats to this conclusion.

**A pocket of diversity.** First, one subfield of philosophy of economics shows that homogeneity compounding is not inevitable. Section 3.2 has shown that the cluster labeled ‘Realism, Heterodox, Pluralism’ has a share of women almost three times higher than the overall women share of philosophy of economics over the studied period (30% versus 12%). This subfield was small relative to the whole field and is detected for only 8 out of 20 time windows. Yet, its demographics demonstrates that crossroads such as philosophy of economics can harbor a pocket of diversity – this subfield having a proportion of women roughly 50% higher than either economics and philosophy in the relevant subperiod.

The existence of this subfield meshes well with the sequential sorting mechanism described in the introduction. Some scholars trained in economics may have become dissatisfied with ‘mainstream’ economics and thus became attracted by heterodox approaches, including feminist economics. For these scholars, philosophy of economics – especially under the label ‘economic methodology’ – could represent a space where the shortcomings of mainstream economics are discussed and alternatives are developed. For example, some women identifying as post-Keynesian economists published in economic methodology important contributions around the notion of pluralism and an open systems approach (Dow, 2001; Chick and Dow, 2005). Others have explicitly contributed to feminist economics, including research at the crossroads of feminist, heterodox, and post-Keynesian economics that connect realism and diversity (Austen and Jefferson, 2010; Jefferson and Austen, 2015). In the *Journal of Economic Methodology*, Austen and Jefferson (2006, p. 279) articulated this combination of post-Keynesian and feminist concerns:

[Post-Keynesian Economics] appears to provide a range of specific and detailed questions about the nature of the reality they are examining, including the existence of fundamental uncertainty, the role of money, and the open nature of social systems. In contrast, feminist economics appears to give greater weight to the location of researchers within the society that they are investigating, and this helps to explain their greater emphasis of epistemic issues.

In short, the cluster with the highest proportion of women was potentially a haven for many who were discontent and could voice critical positions and propose alternatives regarding both the ontological presuppositions and the social epistemology of mainstream economics.

**A trend toward gender parity.** The second caveat to our claim that homogeneity compounding is descriptively accurate for philosophy of economics is that there is some progress

toward gender parity in the specialty taken as a whole, a progress which seems to be faster than in both economics and philosophy (see Figure 5). This progression of women in the author share is broad based because we detect the disappearance of the subfield with a concentration of women in the late 2000s. Yet, philosophy of economics is still very far from gender parity, women being roughly one author out of five around 2020. Furthermore, the very low proportion of women in 2022 (4.5%) illustrates how fragile this progress is. Again, this sharp regression at the end of the period is most probably attributable to the COVID-19 pandemic, which has impacted women in academia significantly more than men (Dahlberg and Higginbotham, 2021; Gao et al., 2021).

## 4.2 Possible factors for homogeneity compounding

The unequal gender distribution of authorships in philosophy of economics is troubling. The main goal of our article was to describe this distribution. The next step should be to explain why homogeneity compounding occurs in the specialty such that effective strategies can be deployed to move decisively away from extreme gender imbalance. Although our data do not allow us to rigorously identify the causes of this imbalance in authorship, it does suggest a few potential explanations.

Let us start by assessing two explanations that would imply that there are major problems with our strategy for measuring gender shares in philosophy of economics. Considering them also gives us an opportunity to discuss potential limitations of our study.

**Strategic journal choice.** A first possible explanation is that women, even when they work in philosophy of economics, decide less frequently than their men counterparts to publish their research in the two main field journals. For instance, early-career philosophers of economics could strategically target journals in their main discipline (economics or philosophy) in order to have better odds of securing a tenure-track position. Because they evolve in men-dominated disciplines, women in philosophy of economics could be more prone than men to rely on this disciplinary strategy – as suggested by some recent evidence on the degree of interdisciplinarity of PhD research (Liu et al., 2023). If this explanation is correct, our main focus on the two main field journals generates a systematic underestimation of the proportion of women authors in philosophy of economics understood more broadly.

There appears to be some truth to this explanation: we find that articles in philosophy of economics published in philosophy journals not dedicated to the specialty have had higher proportions of women authors than the two main field journals (Figure 8). Over the period of comparison, the proportion of women is 33% higher in the journals that are not field specific. However, this explanation can account for only a small fraction of the gender imbalance. If we focus on philosophy of economics in general philosophy journals, the gender share remains lower than in economics and philosophy. Furthermore, this gender share in other philosophy journals has progressed very slowly, such that its historical difference with the two field journals had vanished in the early 2020s (see Figure 8). In sum, homogeneity compounding holds for our two corpora representing philosophy of economics – only the extent of the phenomenon and its temporal profile vary.

**Non-authorship activities.** The second possible explanation targeting our empirical strategy is that the place of women in the field is not appropriately measured by their proportion among authors (in any journals). Indeed, there is a vast literature on the “productivity puzzle” – the empirical regularity that, on average, “men publish more than women over the course of their career” (Huang et al., 2020). If this gap in productivity is large for philosophers of economics, measuring proportions of authorship would significantly underestimate the proportion of women active in the field. Furthermore, women could have a stronger tendency to play other roles that are as important for the development of the field – e.g., mentoring the new generation of scholars, organizing events, and editing journals, collectives and special issues.

Again, this possible explanation is not without merits: we have already noted the absence of women with more than six articles authored in the two main field journals, while a few men have more than double this number. However, a productivity differential explains very little when we look more closely. To start with, since our main result compares philosophy of economics to its parent disciplines (economics and philosophy), the explanation would need to include a further claim that the productivity differential is significantly stronger for philosophy of economics, but there is no reason to assume such a thing. More importantly, we already have a proxy for the number of scholars active in philosophy of economics: the number of unique names among all authors in the two main field journals. Among the 887 unique names with an attributed gender, only 125 are women, which gives us the estimate that 14% of scholars active at one point in philosophy of economics are women. Hence, there is no solid reason to think that our focus on authorship produces a measure of gender disparity that profoundly underestimates the place of women.

**Role models.** The existence of a productivity differential points us toward the first promising explanation that takes our descriptive results seriously. We would expect that scholars active in philosophy of economics would be able to only name a handful of persons who they consider as founders or leading figures in this small field. These personal lists will overlap imperfectly, but most lists will have to have very few women, in part because no woman has flooded the field with publications over a long career and because, until recently, the women who have had major influence by explicit contributions in the field did not primarily self-identify as philosophers of economics or economic methodologists.<sup>8</sup> There is ample evidence that women’s career choices in science (Young et al., 2013) as elsewhere (Quimby and Santis, 2006) are influenced by the presence of role models – i.e., successful persons to whom they can identify (Thompson, 2017). Hence, the limited visibility, in the first decades of the field, of women projecting an identity of philosopher of economics could well be a major cause of the slow pace at which the field is moving toward parity. Gender homogeneity breeds gender homogeneity through a very skewed distribution of available role models.

If the initial lack of role models is a central factor to explaining the field’s strong gender

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<sup>8</sup>For instance, on their personal websites, Nancy Cartwright (1994) self-identifies as a general philosopher of science and Deirdre McCloskey (1982) has a plural self-identification including historian of economics and heterodox economists. The same holds true on their dedicated Wikipedia pages.

homogeneity, it gives some hope for the future: given that some women have become central figures in philosophy of economics more recently, a virtuous spiral could accelerate the movement toward gender parity. We now turn to various interrelated factors that, we believe, should lead to moderate this optimism without denying that role models are important.

**A philosophical turn.** Although philosophy and methodology of economics started off as a meeting point between like-minded philosophers and economists, it appears that the balance has progressively shifted toward a stronger affiliation to philosophy. Evidence of this shift is currently patchy, but all indicators point in the same direction. We borrow the phrase “philosophical turn” from Heilmann and Reiss (2021, p. 3), who note that “currently, the academic discipline of philosophy hosts the main study programs, scholars, journals, and conferences.” In a review of their *Handbook*, D. Wade Hands (2023, p. 122), who served for fifteen years as co-editor of the *Journal of Economic Methodology*, points in the same direction by asserting that “[t]he disciplinary affiliation of the philosophy of economics has clearly moved from economics to philosophy.”

	1994-2009	2012-2021
Share	86%	36%

Table 2: Share of PhD in economics for the ten women with the highest number of articles over the period

Two other elements of evidence can be added. First, while in the early years of the JEM and E&P, the most invested women in the journals had a PhD in economics, most of them nowadays have a PhD in philosophy and are affiliated to a philosophy department (Table 2). The few that still have a PhD in economics either defended their thesis before 1990 or are French.<sup>9</sup> Second, we saw that our corpora of philosophy of economics articles in more generalist philosophy journals (that we labeled ‘wider philosophy of economics’) has boomed between 2007 and 2021, from below 50 articles per year to above 150 articles, outpacing by far the growth of articles in the two main field journals (see Figure 1). Space and time permitting, we could have studied a third corpus, labeled “JEL Economic Methodology” by Claveau et al. (2021), which corresponds to articles tagged with the JEL Code “B4 Economic Methodology” in EconLit, but not published in the two main field journals. However, according to Figure 11.1 in Claveau et al. (2021, p. 153), the size of JEL Economic Methodology had barely increased since the late 1990s, with an annual output in the late 2010s of around 60 articles. This comparison is an other indication of a shift toward philosophy.

In most of this article, we have shortened the expression ‘philosophy and methodology of economics’ to ‘philosophy of economics’ to exactly suggest that the field has turned toward philosophy. Indeed, the choice of terminology between ‘philosophy of economics’ and ‘economic methodology’ depends greatly “on the primary disciplinary context of the activity” (Mäki, 2012, p. xv) – respectively, philosophy and economics. If philosophy has become the

<sup>9</sup>We find a French exception regarding the disciplinary affiliation of authors where French philosophers of economics are mostly affiliated to economics department.

primary home discipline of this specialized field, the expression ‘philosophy of economics’ will impose itself.

We do not want to suggest that this turn toward philosophy is a good thing overall – a claim which is also not necessarily endorsed by other observers (e.g., Heilmann and Reiss, 2021; Hands, 2023). There are various pros and cons to such a shift, and, when it comes to gender distribution, it is unlikely to help accelerate the transition toward parity.

Indeed, a turn toward philosophy decreases the likelihood that women joining the specialty do so because, as members of an underrepresented group in their initial discipline, they have a critical perspective on its organizational and cultural shortcomings. To be sure, women in both economics and philosophy have solid reasons to be critical of masculine biases at play (Sugimoto and Larivière, 2023, p. 19). However, the discipline where these frustrations and injustices are lived has a likely impact on the demographics of philosophy of economics. Women economists could find in philosophy and methodology of economics a community to discuss the problems of economics that they experience firsthand. The reverse does not hold: women philosophers suffering from the men-dominated environment of contemporary philosophy need other reasons to turn to philosophy of economics. Hence, if the inflow in the field would be mostly of philosophers, we can hardly expect a strong sorting mechanism leading to a pocket of diversity. It is unlikely to be a coincidence that the subfield that constituted a clear pocket of diversity disappeared in the last decade of our period, when the philosophical turn became entrenched.

**The neglect of heterodox approaches.** The fact that the subfield labeled ‘Realism, Heterodox, Pluralism’ is small and transient points to another possible factor explaining the extreme gender homogeneity in philosophy of economics: heterodox topics have never been central to the field. Previous bibliometric studies of the two main field journals did not even find a cluster with a heterodox identity (Claveau et al., 2021; Truc et al., 2021). In this article, we find a small heterodox cluster because our detection method is finer-grained. Yet, the general result of a relative neglect of heterodox approaches still holds.<sup>10</sup> Furthermore, tensions exist between philosophers of economics and heterodox economists. A recent example is E. Roy Weintraub’s (2023, p. 6-10) criticisms of the incursion of heterodox, pluralist, and feminist economists in history of economics and economic methodology over the years. According to him, the two communities have conflicting epistemic goals.

Without taking sides in this debate, we recall our evidence that heterodox economics is among the most gender diverse subfields in economics (see Figure 6 and accompanying text). Since philosophy of economics is often rather unwelcoming to heterodox topics and scholars, it probably influences on the progression of its women share. Nowadays, heterodox economists pursue their own research programs with little interaction with specialized philosophy of economics, sometimes under the JEL Code “B4 Economic Methodology”, which is still strongly associated to heterodox approaches (Claveau et al., 2021, sec. 4.2).

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<sup>10</sup>Although the general result of a relative neglect holds, our detection of a temporary heterodox cluster also corroborates the thesis that there is a turn away from heterodox approaches (see Hands, 2015), which is a claim Truc et al. (2021) objected to based on their bibliometric evidence.

**Other neglected topics.** Heterodox topics are not the only topics present in economics that are shunned by philosophers of economics. In a recent paper, Claveau et al. (2024, p. 16) identify specialties that attract very little attention in philosophy of economics despite being important in economics itself. The four specialties that rank as most neglected are labeled by the authors: ‘Climate’, ‘Competition’, ‘Empirical Micro’ and ‘Trade and Growth.’

The similarity to our list of economics specialties with the highest women share is striking. In Figure 6, we labeled our top five: ‘Applied Econometrics’ (analogous to ‘Empirical Micro’), ‘Environment’ (analogous to ‘Climate’), ‘Heterodox’ (discussed above), ‘Trade’ (analogous to ‘Trade and Growth’) and ‘Efficiency’ (perhaps analogous to ‘Competition’, but further verification would be required). Hence, it appears that the economics specialties that philosophers of economics happen to shun are those that have the highest share of women authors.

The reasons for this pattern are probably complex, but it seems plausible that the pattern entertains a bidirectional relationship with the gender distribution in philosophy of economics. Since women are scarce in philosophy of economics, the field is more likely to overlook the topics that attract the attention of women in economics. For instance, men may tend to judge topics in applied fields as less worthy of philosophical attention, often without realizing that they perpetuate a gender bias. In the other direction, women may be less attracted by philosophy of economics because the field focuses on parts of economics that are most dominated by men. These two directions can reinforce each other and lock philosophy of economics in a state of low gender diversity and selective attention to economics.

**Mathematics.** To be sure, an inflow of women does not necessarily follow when philosophy of economics relates to a specialty with a comparatively high share of women. The most extreme case in our results is the philosophical specialty of ‘Ethics & Political Philosophy’ (Figure 7). Although it constitutes a pocket of diversity in philosophy with a share of women authors above 28%, the analogous subfield in philosophy of economics – labeled ‘Political Philosophy’ in section 3.2 – is far more homogeneous, with a women share of only 13%. It thus appears that the way ethics and political philosophy are done in philosophy of economics discourages women participation.

As before, this pattern is probably sustained by complex feedback loops, but one factor should be mentioned: the relatively heavy reliance on mathematics or, more generally, formal methods in philosophy of economics. A vivid illustration of this reliance is found in an issue of E&P in 2012 on “formal ethics”, which contributed to that year’s men-only volume of the same journal. While ethics and political philosophy embrace many approaches in philosophy, the dominant approach in philosophy of economics is formal, relying on the mathematical apparatus of normative economics.

The negative relation between reliance on mathematics and the share of women authors is found elsewhere in our results. In philosophy of economics, the only cluster with a women share significantly lower than the field’s very low average is ‘Decision Theory’ (see Section 3.2), which is the most formal subfield in the two specialized journals. It uses the mathematical tools of utility theory, game theory and social choice theory to explore the

concept of ‘action’ with formal models. In economics, the analogous field – labeled ‘Games’ in Figure 6 – is also the least gender diverse specialty. In philosophy (see Figure 7), formal fields such as ‘Logic’ are among the least gender diverse, together with fields working on very abstract topics, such as ‘Epistemology I,’ which focuses on the definition of knowledge, and ‘Metaphysics,’ on truthmakers and the like. Furthermore, the heavily mathematized philosophy of physics (in ‘Philosophy of Science II’) has a far smaller proportion of women authors than ‘Philosophy of Science I,’ in which the study of mechanisms and biology are central.

These examples seem to be instances of a more general phenomenon in science: fields strongly associated with the use of mathematics have gender distributions most tilted toward men. STEM fields (science, technology, engineering, and mathematics) have historically low rates of women participation (Wang and Degol, 2017), even though measures of ability suggest that more women have the relevant academic strengths to succeed in STEM education (Stoet and Geary, 2018). There is a vast literature offering explanations of this phenomenon and proposing interventions to correct the situation, mostly underscoring how cultural norms operating already during early childhood can generate large social differences from limited biological variation (Breda et al., 2020; Girelli, 2023; Schmader, 2023).<sup>11</sup>

Contemporary philosophy of economics is among the most math-oriented fields in philosophy: it relates to economics as a discipline that proudly claims to be a mathematical science; inside this discipline, it maintains strong connections to the most formal specialty, decision theory; and, when it tackles topics such as ethics and justice – which are addressed in general philosophy from a wealth of perspectives – it frequently does so with a distinctively mathematical approach. Unsurprisingly, as a math-oriented field, philosophy of economics thus conforms to expectations regarding gender distribution: it is extremely tilted toward men.

All in all, the homogeneity compounding observed in philosophy of economics is most probably explained by multiple factors that are mutually reinforcing. Very few key figures in the field’s early years were women, so its trajectory was set in a way that did not speak strongly to women, both in terms of the limited supply of role models for the next generation and in the choice of topics and approaches. Although a pocket of gender diversity developed around research criticizing mainstream economics, with a significant participation of women economists, this subfield was a temporary phenomenon, the end of which was concomitant with the rise of philosophy as the main host discipline of the field. Today, it is hard to imagine how philosophy of economics as a whole could become significantly more gender diverse than its two parent disciplines – economics and philosophy.

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<sup>11</sup>A related literature exists for economics (Emerson et al., 2018; Bertocchi et al., 2023); and math attitudes and skills have been explored in one study with philosophy students in Germany (Herfeld et al., 2022).

## 5 Conclusion

This paper investigates how the gender diversity of philosophy and methodology of economics compares to that of the two disciplines it straddles – i.e., economics and philosophy. Using authorship data for journal articles, we find strong confirmation for what we called the Homogeneity Compounding Hypothesis: the field is located at the crossroads of the two disciplines with the lowest shares of women in the social sciences and humanities (Leslie et al., 2015; Sugimoto and Larivière, 2023) and its own gender distribution is even more skewed against women (Figure 5). We find evidence for the plausibility of a counterfactual history, in which the field becomes a pocket of diversity where women economists converge to analyze the organizational and cultural shortcomings of economics. However, the seeds of this alternative history seem to have died when the field pivoted toward philosophy, turning away from economics, in the late 2000s (see Section 3.2). We also find tentative evidence of a narrowing gender gap between philosophy of economics and its parent disciplines, but catching up to the laggards hardly counts as a significant achievement.

Our study has a number of limitations. To infer authors’ genders, we use the relative frequencies of reported men and women sharing their first names. Although it is a well-established method for binary gender attribution (Larivière et al., 2013), it does not take into account other gender identities. Our corpora selection also implies limitations since we have to set strict boundaries around an interdisciplinary field and two disciplines. Since our main corpus for philosophy of economics – i.e., articles in the two main field journals – might not be representative of the overall field, we have included a second corpus – i.e., philosophy of economics in other philosophy journals – and found concordant results (Section 3.4). However, other conceptions of philosophy and methodology of economics are not covered. For instance, we have not looked at what Claveau et al. (2021) call “JEL Economic Methodology”, which corresponds to articles tagged with the JEL Code “B4 Economic Methodology” in the American Economics Association’s index EconLit, but not published in the two main field journals. Perhaps the pocket of gender diversity that briefly existed in specialized philosophy of economics moved to this other region of the academic space instead of vanishing altogether.

The most important limitation of our study is that it describes a state of affairs that is depressing, without a comprehensive and rigorous explanation of why homogeneity compounding occurs and without suggesting strategies to move toward gender parity. Certainly, the overarching phenomenon of the leaky pipeline in science, which seems to be underlying our results, is a highly complex phenomenon. As such, the various factors we discussed in Section 4.2 – i.e., the lack of role models, the turn toward philosophy as a host discipline and the potentially existing gender differences in research interests regarding topics and approaches – can only be the beginning of an explanation for the homogeneity we observe in philosophy of economics. All those factors will likely be part of a persuasive explanation, but the causal arrows and the relative strengths of each of the factors will be hard to determine. One step toward a more comprehensive analysis will be to study the dynamics of gender distribution in other interdisciplinary fields with various profiles of parent disciplines



and different historical trajectories.<sup>12</sup> Yet, actions to significantly increase the presence of women in philosophy of economics cannot wait for all research questions to be settled. Fortunately, there are already resources in economics, in philosophy, and elsewhere identifying promising strategies that can be adapted to this extremely men-dominated field.<sup>13</sup> As our own study suggests, further empirical research about the scope and other possible factors responsible for the lack of diversity in the field would be important to formulate and revise interventions well-adapted to philosophy and methodology of economics.

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<sup>12</sup>For instance, econophysics is similar to philosophy of economics as it combines two disciplines with very low women shares (economics and physics), but it does not have the same central objective of reflecting on one of the two disciplines, which makes it an unlikely candidate for a pocket of diversity. In contrast, the available evidence for bioinformatics points to a field with a women share in between that of biology and computer science, probably because more women are attracted to “computing with purpose” than to ‘pure’ computer science (Genut and Kolikant, 2023). Neuroscience showcases yet another profile, as an older interdisciplinary field at the crossroads of many disciplines, and where initiatives to promote women are well under way (Sibener et al., 2022).

<sup>13</sup>See, e.g., The Women in Economics Initiative (<https://www.women-in-economics.com/>); the compilation of resources in The Philosophy Exception (<https://thephilosophyexception.ca/>); Sugimoto and Larivière (2023, ch. 8); Joyce et al. (2024).

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