

An Independent European Macro? A History of European Macroeconomics through the Lens of the European Economic Review

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Abstract

Economics in Europe has encountered a process of internationalisation since the 1970s. To a certain extent, this internationalisation is also an ‘Americanisation’ and many European departments and economics have adopted the standards of US economics, notably mathematical modelling, the use of econometrics, and the neoclassical theory as a modelling benchmark. Regarding this process, we can wonder if European economics has just been mimicking US economics since the 1970s, or if some European specialities have survived or emerged.

In this article, we use topic modelling and bibliometric coupling to identify what have been some European specialities between 1969 and 2002. We focus on one economics sub-discipline, macroeconomics, and we use the articles published in the European Economic Review and compare their bibliographic references and content to what has been published in the top 5 journals.

1. Introduction

In 1987 in the *European Economic Review*, the director of the Centre for Economic Policy Research, Richard Portes, attempted to assess the “state and status of economics in Europe”. He regarded “the standard of comparison [as] obvious: the United States, by far the dominant producer” (Portes, 1987, p. 1329). He then asked “whether there is now any economics outside and independent of the United States.” (1330) He gave a list of the many indices testifying of the US domination, ending it by the fact that “the leaders of the economics profession in Europe were trained as postgraduates in the United States. Many take from the US their professional standards, their views of what are the interesting problems, and their approaches to them”. (*ibid.*)

Indeed, since the early 1970s, economics in many Western European countries had entered in a process of internationalisation (Fourcade, 2009, chap. 3 and 4; Fourcade, 2006). To some extent, such process was also a form of “Americanisation” (Coats, 1996; Goutsmedt et al., 2021): professional and intellectual

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standards were progressively adopted in European countries, mimicking the functioning of the US academic field. English gradually spread as the dominant language in economics (Sandelin and Ranki, 1997) and publications in peer-review journals became the norm for assessing research productivity. The organisation of international events were encouraged to boost research centres visibility (Cherrier and Saïdi, 2021; Goutsmedt et al., 2021). In terms of content, the Americanisation of the discipline in Europe favoured the intellectual standards that had become widespread in the US in the postwar era (Morgan and Rutherford, 1998): the use of mathematical economics and econometrics, and the reliance on neoclassical theory as a benchmark for modelling.¹

In parallel to this Americanisation, we can observe a process of ‘Europeanisation’: many initiatives from the first issue of the *European Economic Review* (EER) in 1969 to the creation of the *Economic European Association* (EEA) in 1984 promoted the development of intellectual exchanges between European economists—while obviously keeping US economics as a model. The simultaneous spreading of US standards in Europe after the 1970s and the promotion of a European economics transcending national traditions bring us back to Portes’s 1987 question: was there a possibility after the 1970s for the existence and persistence of a European tradition of economics, relatively autonomous from the US profession?

Portes pointed out some European “comparative advantages” (Portes, 1987, p. 1332) even if some of these European specialities had been pioneered by US economists. He highlighted the dynamism in Europe of “general equilibrium theory[,] social choice, duality, and the analysis of repeated games”, “international macroeconomic policy coordination” or “Non-Walrasian macroeconomics” (*ibid.*). Goutsmedt et al. (2021) have also highlighted that within the *International Seminar on Macroeconomics* (ISoM), whose proceedings were published annually in the EER, Disequilibrium macroeconomics and large-scale macroeconomic modelling constituted important rallying points until the mid-1980s for the European economists involved in the ISoM.²

The purpose of our article is to investigate this issue systematically and quantitatively. Regarding the history of the EER and its importance in the promotion of a European economics (see section 2), we think that it constitutes a good proxy for observing the emergence and persistence of ‘European specialities’. We define specialities as widespread research topics (*i*) distinct from what US-based economists were doing, (*ii*) adopted by many European-based economists in different European countries, and (*iii*) bringing collaboration between different universities. Using bibliometric coupling and topic modelling joined to more

¹Of course, this process of Americanisation did not go without conflicts: many “local conflicts” emerged between more “nationally-trained” economists (generally locally trained) and “internationally-trained economists” who had been often trained in the US (Fourcade, 2006). These conflicts involved intellectual matters (for instance around the relevance of the neoclassical theory) as well as institutional issues, like the criteria to assess the quality of economists’ work and thus to determine hiring and promotion.

²Clarifying the label of non-walrasian macro here. Ref to backhouse and boianovsky

qualitative content analysis, we identify European specialities from 1973 to 2002 (section 3).³

The history of recent economics has mimicked the hierarchy of the discipline by focusing mainly on US economists (and their ideas) or institutions. Of course, some history of economics articles have dealt with the peculiarities of economics in some European countries since the 1970s or with important European economists (Benest, 2019; Maes and Buyst, 2005). However, our goal here is to investigate this issue at the European level and to understand if the internationalisation of the discipline since the 1970s have been accompanied by the emergence of European specialities, relatively independent of the US main topics and overcoming mere national traditions. Besides, we use quantitative methods, as we think that the latter are useful to get a general picture while limiting biased choices and focus.⁴

However, we are focusing only on macroeconomics articles, mainly because we think that such an investigation involved in-depth qualitative *and* quantitative analyses of these specialities and a relatively good knowledge of the literature. A similar investigation on the whole economic field would have been beyond our analytical capabilities. Besides, macroeconomics constituted a substantial part of EER publications, even representing almost half of all the articles in the early 1980s (Figure 1). Macroeconomics was also instrumental in fostering collaborations between European economists as the “International Seminar on Macroeconomics” testifies (see Section 2.2). This article also relies on a unique dataset, which has been constituted by merging the content of four different institutional databases (see Section ??).⁵

2. The Creation of the EER

2.1. The Birth of a European Project

In 1969, Jean Waelbroeck and Herbert Glejser, both from the *Université Libre de Bruxelles* (ULB), launched the *European Economic Review*. The new review was planned to be the official journal of the European Scientific Association of Applied Economics (ASEPELT), which had been created in 1961 by Waelbroeck and another ULB economist: Etienne Kirschen. Before 1969, the association published in English a bulletin gathering research in econometrics and mathematical economics (Waelbroeck and Glejser, 1969, p. 4). The EER took up this torch by publishing the same type of research. Articles had to be

³[Could be revised depending on our final choices] The corpus we use (see section ??) has very few abstracts between 1969 (the date of the creation of the EER) and 1972. Besides, there is no JEL code for EER articles before 1973, preventing us for identifying macroeconomics articles (see below). After 2002 and the creation of the *Journal of the European Economic Association*, the EER was not the official journal of the EEA any more.

⁴Indeed, it could be easy and tempting to pick such or such areas of study and find one or two important European economists working on it, to make it a European speciality. Even if they involve choices and interpretations, we think that the methods we use limit this risk

⁵The article is also accompanied by a detailed methodological Appendix.

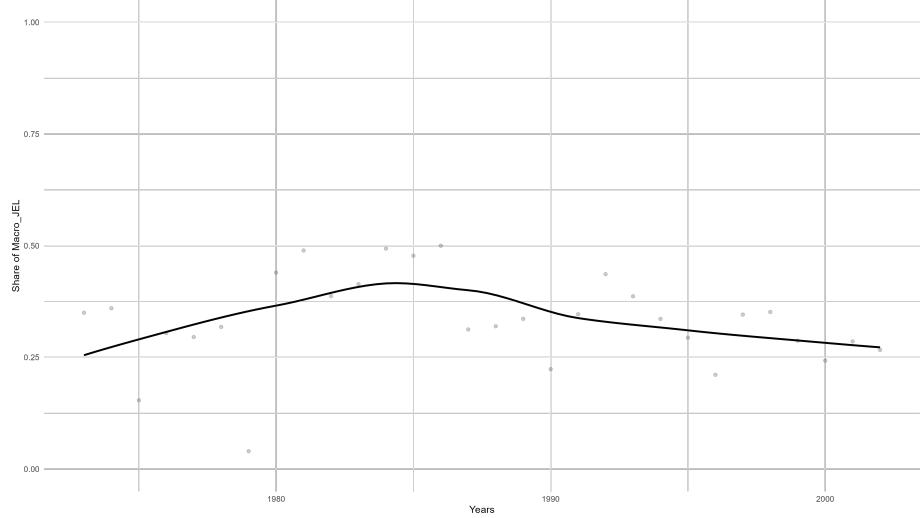


Figure 1: Share of Articles with at least one macroeconomics JEL code

published in English, the new “*lingua franca* of economics” triggering the process of “internationalisation of our science” as Waelbroeck and Glejser polemically stated in the introduction of the first issue (*ibid.*).

The fact that such a project was born in Belgium is no coincidence. Indeed, the country displayed a high effervescence regarding the internationalisation of the discipline. In 1966, Jacques Drèze had established the Center for Operations Research and Econometrics (CORE) at the *Katholieke Universiteit Leuven* (before its split), on the model of the Cowles Commission and the Carnegie Institute of Technology, which Drèze had visited in the 1950s (Düppé, 2017).⁶ The CORE developed a research program around econometrics and macroeconomic modelling and quickly stimulated the establishment of a European research network of economists, notably through its large visiting programme (Düppé, 2017; Maes and Buyst, 2005). Encouraged by Waelbroeck, the ULB department of economics joined the CORE in its first years of existence (Maes and Buyst, 2005, p. 79).

The EER being a Belgian-centred initiative, Belgian institutions represented one fourth of authors’ affiliations in EER articles in the first years (Figure 2).⁷ Nonetheless, the EER authorship became increasingly diverse in the 1970s in terms of geographic affiliation. From the beginning, the EER was conceived as a European project and the composition of the editorial board testifies of it

⁶KU Leuven was split in 1968 between a Flemish and a French-speaking part, the latter giving birth to the *Université Catholique de Louvain* at Louvain-La-Neuve, where the CORE eventually moved in the mid-1970s.

⁷This is an approximation, as the affiliation per author is not available in our corpus and we only have the affiliations per article (see Appendix B.2. for more details).

(Figure 3).

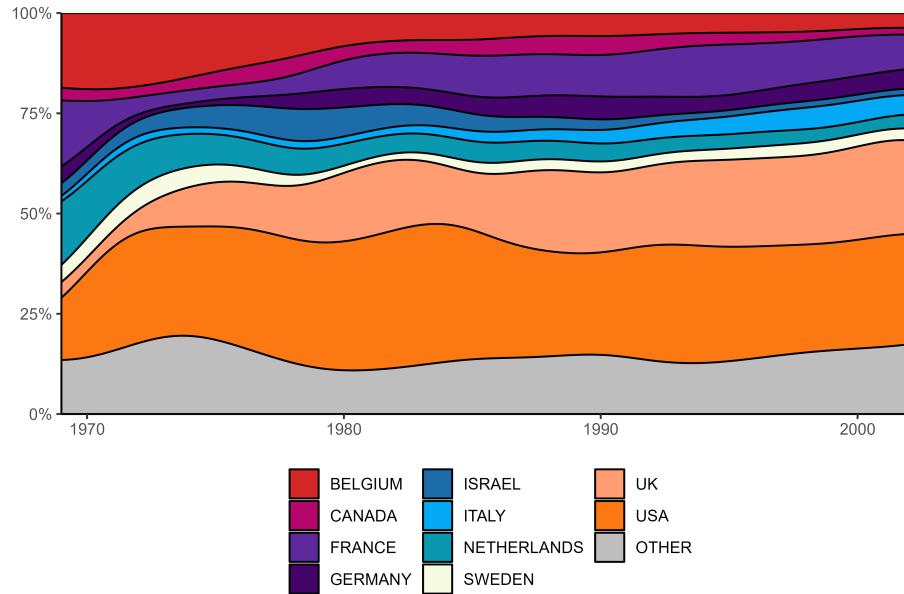


Figure 2: Share of countries of authors' affiliations in EER publications (Top 10)

The EER was one of these crucial initiatives that contributed to the development of intellectual exchanges between European based economists (Goutsmedt et al., 2021). The centrality of the journal was strengthened in 1984 when the European Economic Association was created, and the EER established as the official journal of the new association.

2.2. A Rising European Journal

Outside of offering a common platform for European economists, the journal initial goal was also to encourage the promotion of a US style of doing economics. An important dimension of the journal was thus the progressive integration of US-based economists. The “International Seminar on Macroeconomics,” co-organized by the French *Ecole des Hautes Etudes en Sciences Sociales* and the US National Bureau of Economic Research, played a key role in that integration of US economists, as the conference papers were published each year in a special issue. It also likely contributed to make the journal known on the other side of the Atlantic.

The share of US-based authors publishing in the journal grew steadily in the 1970s and reached a third of all affiliations in the early 1980s (Figure 2). The increase of US economists participation to the EER does not mean uniquely that more articles were published by US authors, but also that the number of collaborations between US- and European-based economists increased (Figure

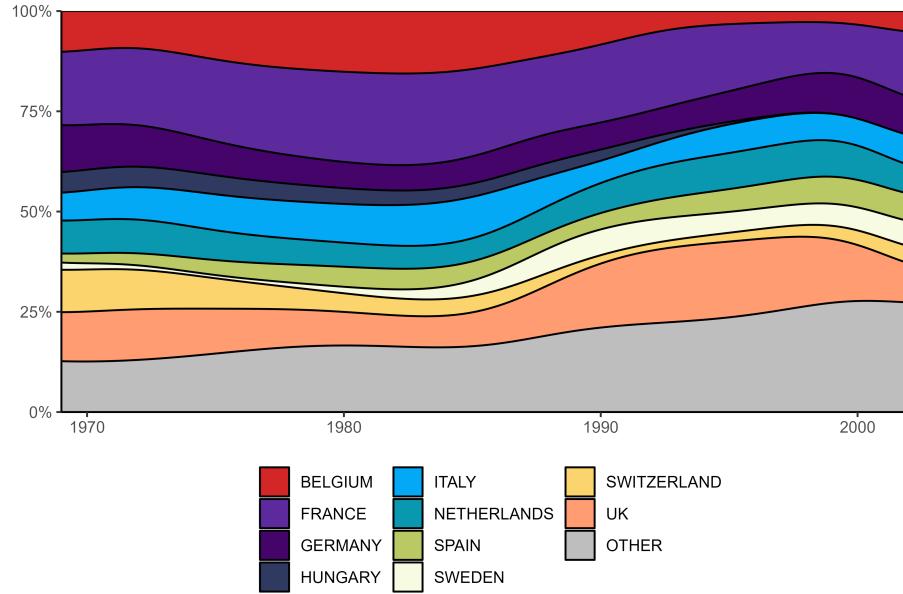


Figure 3: Share of countries in EER editorial boards (Top 10)

4). While there was no collaboration in the first year of the journal, 10 percent of the articles published in 1980 mixed institutions from the US and Europe.

In the mid-1980s, the journal was thus a symbol of a more integrated European economics, inspired by the US standards, as well as it was attracting many US economists to publish in it. Its intellectual influence similarly expanded and it became a major economic journal, overcoming other important European journals in terms of bibliographic citations (Figure 5). This trend was even more significant in macroeconomics (Figure ??)

But has this whole process led to the total standardisation of a European economics on the US model, or has it led to the development (or persistence) of proper European specialities?

3. Methods for Identifying European Specialities

The first step was to build our dataset. To identify European specialities, we compare macroeconomics articles published in the EER and in the Top-5 journals (*American Economic Review*, *Journal of Political Economy*, *Econometrica*, *Quarterly Journal of Economics*, *Review of Economic Studies*). Focusing on the Top 5 allows us to only get the most popular and dominant trends in macroeconomics and thus to draw clearer comparisons with what is published in the EER. Besides, the EER was created with the intent to establish an elite leading journal for the European community that would imitate the standards of

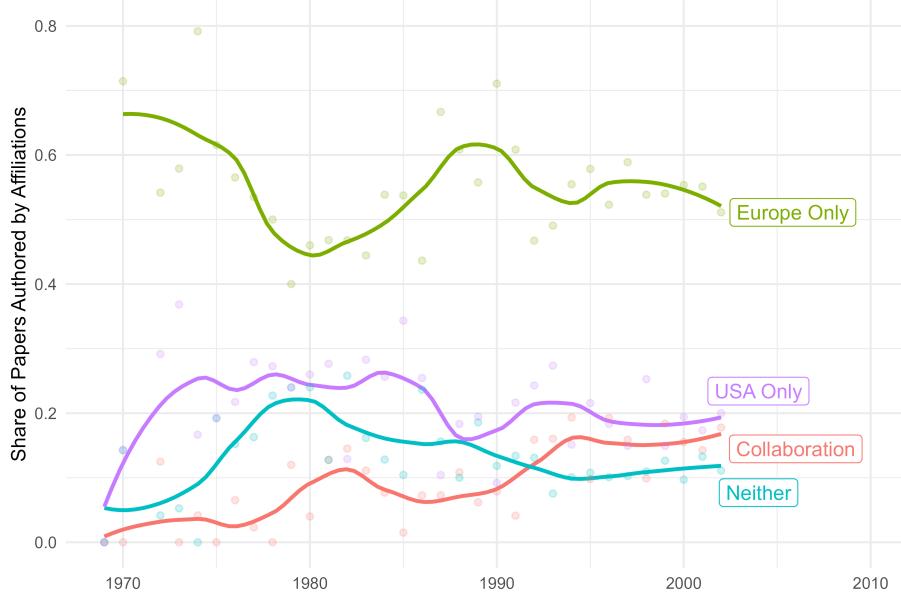


Figure 4: Patterns of collaboration between the United States and European countries in EER (noodle version)

US major journals. The Top 5 thus seems an adequate benchmark to compare the EER to.

We identify macroeconomics articles by using the former and new JEL codes classifications (JEL, 1991).⁸ Outside of JEL codes data, we have used three different databases to collect different types of information: outside of basic metadata (year of publication, title, authors, etc.), we have collected the list of bibliographic references of the EER and Top-5 articles, the abstracts, and authors affiliations.⁹ Then, we have conducted two different types of analysis to identify European specialities.

3.1. Bibliographic coupling

Bibliographic coupling connects articles together depending on the bibliographic references they share. We build different networks of EER and Top-5 articles (the nodes of the network), connected together by a weighted edge, depending on the number of references two articles share together.¹⁰ We build networks on a moving ten-year window (depending on the year of publication of

⁸See the complete list of all the JEL codes we have used in Appendix B.1..

⁹Crossing databases has been necessary due to missing years and information in the different databases we have used (Web of Science, Scopus and Microsoft Academic Premier). See the Appendix B.1. for more details on the building of our dataset.

¹⁰For more details on the measure of weights, see the Appendix B.3..

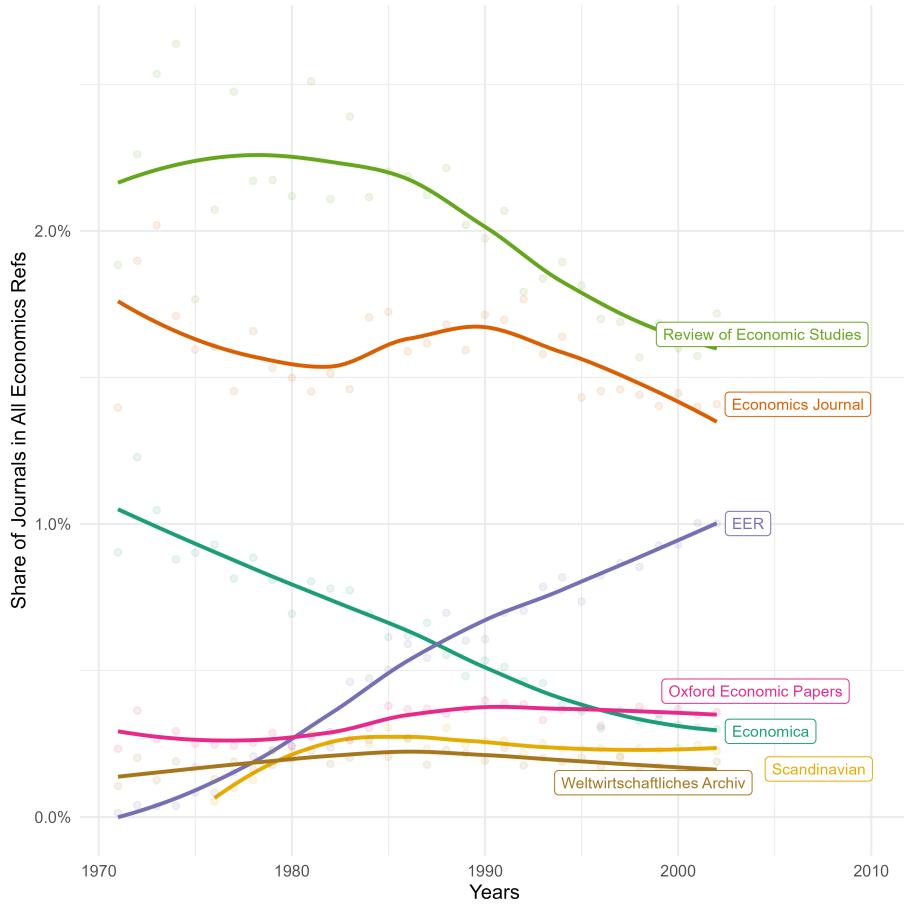


Figure 5: Share of total citations from economics journal going to EER

the articles). We thus have ALEX TO DO networks from the 1973-1982 period, through 1974-1983, 1975-1984, *etc.*, to the 1993-2002 period.¹¹ For each network, we use the Leiden algorithm (Traag et al., 2019) to identify bibliographic clusters, that is groups of articles that share many references in common, and few with articles outside their cluster. Articles which belongs to the same cluster are more likely to share cognitive content (e.g., sharing objects of study, methods, results or theory) even if disagreeing (Claveau and Gingras, 2016; Goutsmedt et al., 2021; Truc et al., 2021). Finally, we test the similarity of the clusters two by two for successive time windows, and merge clusters from different windows

¹¹Due to missing JEL codes for EER before 1973, we are forced to begin with the 1973-1982 window.

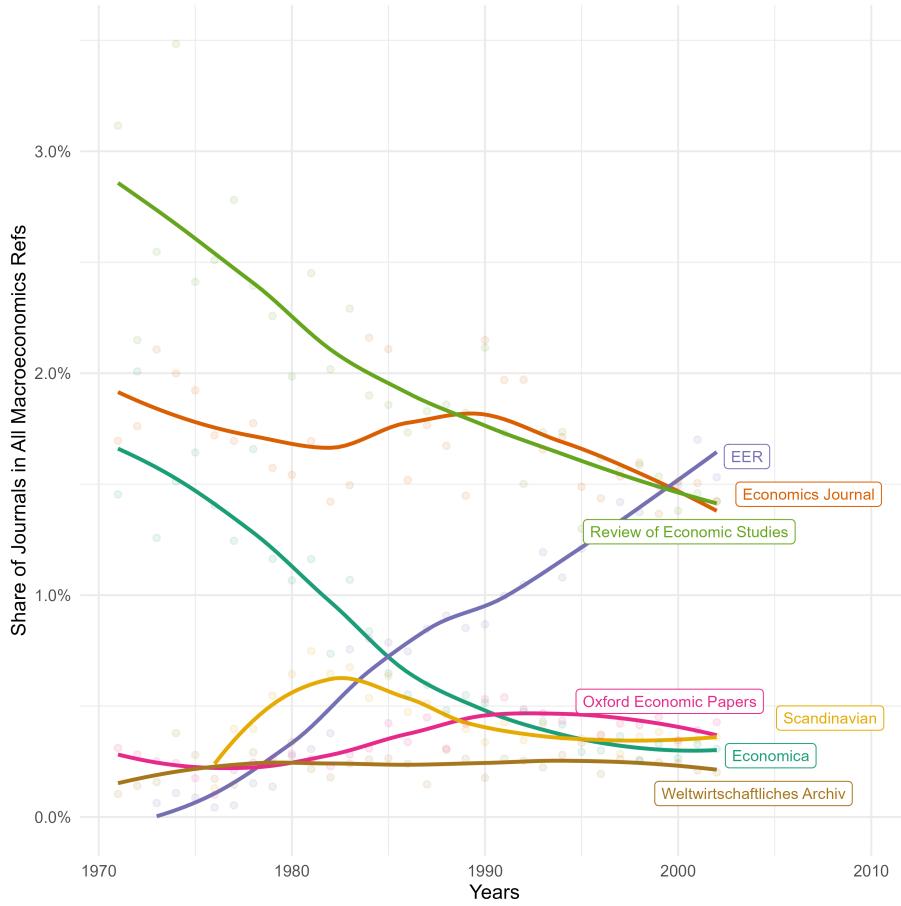


Figure 6: Share of total citations from macroeconomics articles going to EER

together when they are sufficiently close.¹²

This process allows us to obtain dynamic clusters. Indeed, citation patterns are highly dependent of the date of publication of an article: scholars tend to cite more recent works. Consequently, for large time window, clusters would likely be determined mainly by the publication year, rather than by what they are talking about.¹³ By taking small time windows and then by merging communities in different windows together, we avoid this problem and are able to identify communities over longer period of time. We identify a total of ALEX TO DO

¹²See the Appendix B.3. for details on the merging criteria and summary information.

¹³In other words, articles would be grouped together depending on the year of their publication and the clusterisation of the network would not say much of the economic content articles grouped together would share.

communities but only ALEX TO DO are (*i*) present in at least two networks (i.e. two time windows) and (*ii*) represent more than 5 percent of the nodes of at least one of the network they belong.¹⁴

A set of indicators allows us to understand what these clusters are about—e.g. the words used in abstracts and titles, the recurrent authors and the most cited references. These indicators help us to name the clusters. For each cluster, we calculate the difference between the mean of the cluster articles published in the EER and the same mean for the Top 5. We do the same for the articles published by European-based economists only, and those published by US-based economists only [PRECISE METHOD]. These two differences inform us on what are the most ‘Europeans’ clusters, meaning those where relatively more articles are published in the EER by European-based economists.¹⁵ The figure 7 display the position of each cluster relatively to these two differences. When we sum the two differences, we have a synthetic indicator of how much a cluster is European.

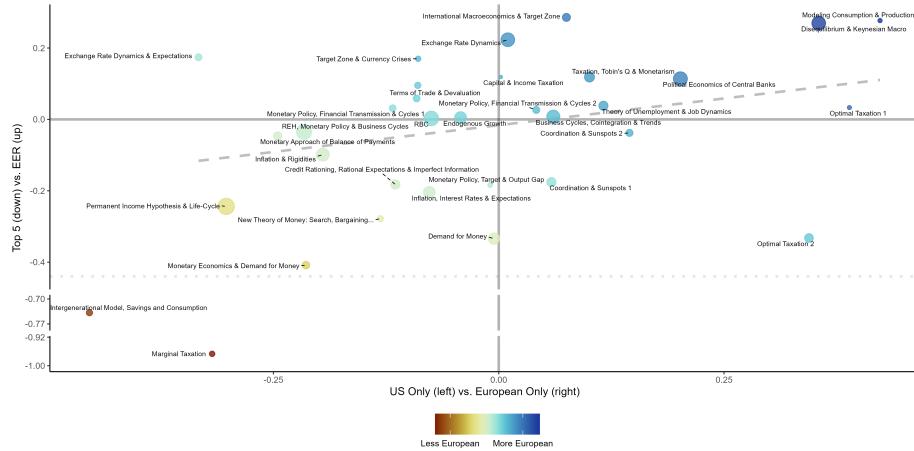


Figure 7: The most European communities

3.2. Topic Modelling

Topic modelling is a non-supervised machine learning method which associates (*i*) the *ngrams* contained in a corpus to k topics and (*ii*) the documents of the corpus to the same k topics.¹⁶ We have used a variant of the Latent Dirichlet

¹⁴ See table footnote

¹⁵ Our assumption is that the content of articles published in the Top 5 by European economists could be more largely influenced by the standards of Top 5 journals and of US macroeconomics, and thus could be less representative of European economics than the articles published in the EER.

¹⁶ From the documents of our corpus, we extract (or ‘tokenise’) unique words (or unigrams), bigrams and trigrams. Stop words and other uninformative words are excluded and all words are ‘lemmatised’. See the Appendix B.4. for more details on the preprocessing steps we use.

Allocation model with the Correlated Topic Model (Blei and Lafferty, 2007). The number of topics k is chosen by the modellers: after assessing quantitatively and qualitatively different models, we choose to run the model with 50 topics.¹⁷ For each topic, we can look at the word with the highest ‘FREX’ value (Bischof and Airoldi, 2012).¹⁸ The Table 2 displays the words with the highest FREX value for each topic.

Similarly to what we do for bibliometric coupling, we are interested in the topics characteristics regarding the publications (*EER vs. Top 5*) and the countries of affiliations of the authors (*the US vs. European countries*). As each article has a ‘rate of belonging’ to each topic (the *gamma* value), we are able, for each topic, to compute the difference in the means of *gamma* values for (i) articles published in the EER and articles published in the Top 5 and (ii) articles written by US-based authors and those written by European-based authors. The resulting two differences are the coordinates of the 50 topics in Figure 8. When we sum the two differences, we have an indicator of how much a topic is a European topic.

3.3. Why mixing the two methods?

To identifies specialties in a corpus, the existing literature usually use bibliographic information and network analysis (topology-based approach) or textual information and topic modeling (topic-based approach). In the first case, articles that share the same bibliographic informations (e.g., same references) are considered similar and part of the same specialties (Claveau and Gingras, 2016). In the second case, using abstracts or full-text, topics are assigned to individual articles, and specialties are identified are derived from these topics (**ambrosino2018?**). These two approaches use very different information (bibliographic information vs text), and very different techniques (network analysis and cluster detection vs probabilistic natural language processing).

In the informetrics literature, one can find some attempts to combine both approaches (**ding2011?**; **li2012?**; **yan2012?**; **mao2017?**), but it has never been done in the economics literature. For the present article, we propose to do so by using the two types of analysis jointly to identify European specialties. The heterogeneous nature of both approaches provide different advantages when used together.

First, both approaches give different information and are complementary. Topology-based approach generally identify communities, while topic-based approached identify topics. Communities and topics are often considered intertwined: a community can have multiple topics, and a given topic can be tackled

¹⁷The Appendix B.4. gives more details on the different models we have tested and how we have set the number of topics.

¹⁸FREX is the weighted harmonic mean of the terms’ rank regarding exclusivity and frequency scores. Exclusivity is a measure of how much a term is frequent in a topic in comparison to its frequency in others. In other words, a good topic model is a model where the words in topics are frequently used, but each topic can be easily distinguished from others, for the words associated to this topic are scarce in other topics.

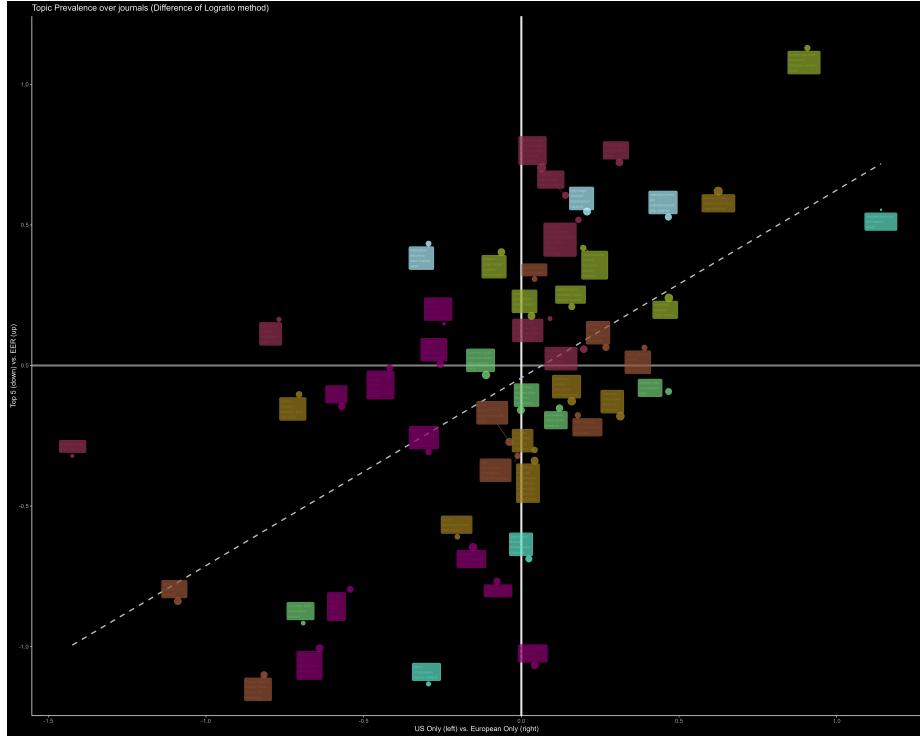


Figure 8: Topic Prevalence over journals (Difference of Means)

by different communities (**ding2011?**; **yan2012?**). For example, a community of co-authors can cover different topics (e.g., a tight network of microeconomists discussing health and education) while different communities can cover similar topics (e.g., sociologists and economists discussing health but never co-authoring papers). Topic modeling can reveal heterogeneity of topics in a given community, while network analysis can reveal the bibliographic or co-authoring network that structure the same research topic. Using both approaches give a more exhaustive picture of the forces that structure economics research. Inversely, using both methods that can also reveal homogeneity, when communities and topics overlaps, then it sends a stronger signal that a community has a specific identity, is tightly knit and well-recognized.

A second advantage of using both methods is that they use different techniques and data sources. Bibliographic and textual data from scientific publications have imperfections. Publications before the 1970s do not always have abstracts, and authors can make mistakes when referencing articles that lead to imperfect identification of bibliographic data. Similarly, from a technical point of view, both approaches are relatively recent, and the best algorithms/models used suffer from analytical limits and are evolving very rapidly (e.g., see (**zhang2020?**) for community detection). Using both approaches jointly can help triangulate

results and both methods can compensate for some of the weaknesses of the other.

4. A Broad Picture of European Specialities

The purpose of our method is to identify different types of literature that are in average more associated to the EER and to articles written by European-based authors. In this section, we get a general idea of the different specialities emerging from bibliometric coupling and topic modelling analyses. In the two next sessions, we will sketch a more encompassing portrait of the evolution of European macroeconomics from the late 1970s to the late 1990s, while leaving aside some of the specialities identified.

First, the two methods allow us to understand what European macroeconomics *was not*. A first consistent finding between the two methods is that the literature about the life-cycle and permanent income hypotheses, influenced by Friedman (1957) and Hall (1978), was far from popular for European economists.¹⁹ Heterogeneity was a central issue for this literature (see Cherrier et al, this issue). Also “less European” are the contributions about the demand for money (for which Baumol (1952) and Friedman and Schwartz (1963) were central references) as well as the “new classical monetary theory” (Hoover, 1988, chap. 6) of the 1970s inspired by Sargent’s, Bryant’s and Wallace’s works (see for instance Bryant and Wallace (1979) or Sargent and Wallace (1982)) or the more recent “New Monetarist Economics” of Kiyotaki and Wright (1989), Kiyotaki and Wright (1993), and Trejos and Wright (1995; see Frasser, 2020, chap. 2, for an historical reconstruction of this literature).²⁰ The new classical monetary theory of the 1970s is described by Hoover (1988, p. 111) as the research for “microfoundations for the theory of money consistent with general equilibrium and individual optimization” promoted by new classical economists (Lucas, Sargent, Wallace, etc.). More generally, it appears that the works of new classical economists that contributed to reshaping macroeconomics in the late 1970s and early 1980s, and that are so central in many history of macroeconomics (De Vroey, 2016), were less influential in Europe at the time. Articles like Lucas (1972), Lucas (1973), Barro (1974), Sargent and Wallace (1975), Sargent and Wallace (1976) or Barro (1976) were constantly undercited by European-based macroeconomists in comparison to US economists in the 1970s and 1980s (see Figure 9).²¹ This is consistent with the fact that European macroeconomists favoured in the late

¹⁹See communities “Intergenerational model, Savings & Consumption” and “Permanent Income and Life-Cycle Hypotheses”, as well as topics 12 and 14.

²⁰See communities “Monetary Economics & Demand for Money” and “New Theory of Money: Search, Bargaining...”, and, even if it is not as “non-European” as the two others, the community “Demand for Money”. For topics, see topic 2 on the demand for money and money supply, which is one of the most non-European topic, but also topic 19 on demand for money and term structure of interest rates, influenced notably by Fama (1975).

²¹We have to wait 1982-1988 to see some new classical contributions cited as much by Europeans as by US economists. The integration of these contributions obviously took some time in Europe and lagged behind the US.

1970s and early 1980s an alternative “microfoundational programme” (Hoover, 2012) with disequilibrium theory and non-walrasian macroeconomics (see Section 5).

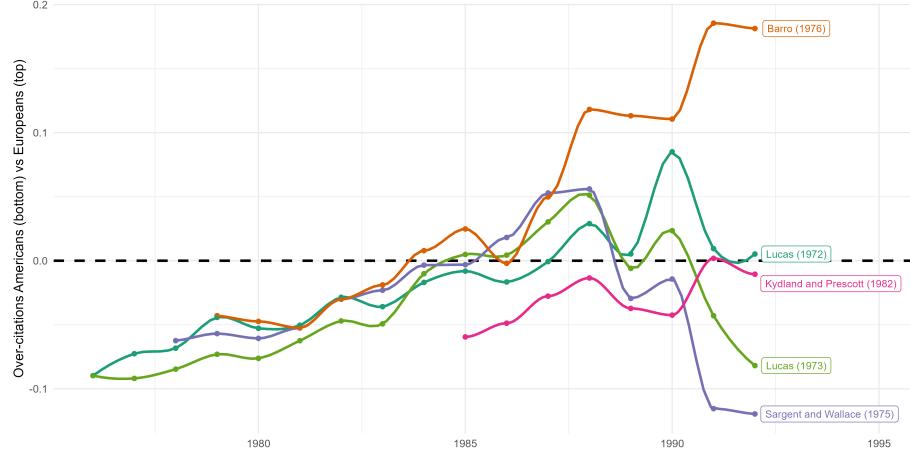


Figure 9: Citation of new classical works by European economists relatively to US-based economists

Second, the EER appeared as a more welcoming support for international macroeconomics. All clusters and topics dealing with this kind of issues are relatively over-represented in the EER (except one small topic on gold standard and dollar reserves), and many topics are also over-represented by European authors (see Figure 7 and 8). Topics and clusters on the political economy of central banking (see Section 6) and on unemployment (relying notably on Pissarides (1990), Mortensen and Pissarides (1994) and Layard et al. (1991)) are also over-represented both for EER and European authors.²² Lastly, our analyses make also appear a proper European approach of time series and econometrics even if in a large part a UK speciality: the “LSE approach” of David Hendry and his colleagues (Qin, 2013, chap. 4) and the treatment of the cointegration issue.²³

The detailed analysis of clusters and topics offer a general panorama of the different issues, methods and theoretical questions investigated by European macroeconomists, in comparison to the US macroeconomics.²⁴ However, this only gives us a fragmented (and for now a-historical) picture of European macroeconomics. In the two last sections, we try to draw a more unified picture of the evolution of European macroeconomics between the mid-1970s and the late 1990s. Even if leaving aside some identified specialities, we consider that

²²See the “Political Economics of Central Banks” community and topic 8 for the first; and community “Theory of Unemployment & Job Dynamics” and topic 37 for the second.

²³See topic 46 and the community “Business Cycles, Cointegration & Trends”.

²⁴See supplementary files for more information.

two dynamics help to understand the interaction between European and US macroeconomics, how European macroeconomics distinguished itself, as well as how it has transformed itself since the 1970s. Non-Walrasian macroeconomics or disequilibrium theory represented in the 1970s and 1980s a theoretical unifying research program for European macroeconomics.²⁵ However it has progressively lost its influence after the mid-1980s (see Section ??). If it did not constitute a similar theoretical program, it appears to us that, in the 1990s, political economy played a similar role, constituting a European speciality touching to many different economic problems (see Section 6).

5. Disequilibrium theory as a landmark for European macroeconomics

Disequilibrium theory constituted an important but often forgotten step in the history of macroeconomics (Backhouse and Boianovski, 2013; Plassard et al., 2021). It contributed significantly to the renewal of interest for the research for microfoundations in macroeconomics in the 1970s (see Duarte and Lima, 2012 for a history of microfoundations in macroeconomics). Anchored in the general equilibrium theory (GET) tradition and influenced by the work of Patinkin, Clower and Leijonhufvud, disequilibrium theory explored the impact of non-walrasian price-setting (i.e. without *tatonnement*), fix-price and quantity rationing on macroeconomic outcomes. It constituted an alternative to new classical contributions and the “representative-agent microfoundational program” of Lucas and Sargent (Hoover, 2012; see also Renault, 2020). Even if Barro and Grossman’s (1971) article was fundamental in the popularisation of disequilibrium macroeconomics, the research program was anchored in Europe, notably in France and Belgium [Goutsmedt et al. (2021); Plassard and Renault, this issue].²⁶

It is quite clear from our bibliometric analysis that the “Disequilibrium and Keynesian economics” cluster constituted the most significant cluster associated to the EER and developed by European economists. This cluster also integrates other “alternative research lines” to Lucas’s research program (De Vroey, 2016, chap. 14), like Azariadis’s (1975) implicit contract model, Hart’s (1982) imperfect competition model or Diamond’s (1982) search model. It testifies that in the late 1970s and in the 1980s, some connections existed between US and European macroeconomists regarding the renewal of theoretical macroeconomics and the search for microfoundations, and the opposition to new classical macroeconomics. The topic modelling analysis allows us to observe how widespread disequilibrium theory was for European macroeconomics in the 1980s and how it unified the treatment of different macroeconomic issues.

First of all, disequilibrium macroeconomics contributed to the persistence of a dynamic research program around GET issues and part of the literature “arose out of the internal problems within general equilibrium theory” (Backhouse and

²⁵Footnote on the label.

²⁶Appendix also displays some statistics on countries and institutions for each cluster and topic.

Boianovski, 2013, p. 105), notably the need to break with *tatonnement* and to build GET model with agents setting prices in the model.²⁷ But quickly, disequilibrium macroeconomics also appeared as an important framework to deal with the explanation of the current stagflation in the 1970s (Backhouse and Boianovski, 2013, chap. 8). Malinvaud's *Theory of Unemployment Reconsidered* (1977) was a decisive step in this direction by developing the opposition between "Keynesian unemployment", caused by excess supply in both goods and labour markets, and "classical unemployment", triggered by excess demand for goods, but excess supply in the labour market (involving that real wages were too high).²⁸ The oil shock of 1973 and the simultaneous decrease of productivity explained the apparition of a classical unemployment in the 1970s. The big issue for adherents to this three regimes approach thus became to be able to assess which part of European unemployment was due to Keynesian or to classical unemployment.

This framework to think about unemployment and the stagflation has been used, discussed, or at least mentioned in many important works for European macroeconomics in the 1980s.²⁹ Drèze and Modigliani (1981) discussed in the EER the "current state of underemployment in Belgium" by analysing the trade off between real wages and employment in the context of a small open economy (2). Drèze and Modigliani explained that they mixed the possibility of classical unemployment, inspired by Malinvaud (1977), and Modigliani and Padoa-Schioppa's argument that, "in an open economy, external balance implies a constraining relationship between the levels of real wages and employment" (2). Similarly, Malinvaud's framework was linked in the early 1980s to the debate, often taking place in the EER, about the "wage gap", that is the assessment of whether real wages were too high (a positive wage gap) or too low. Bruno and Sachs were central characters in this debate and relied explicitly on Malinvaud's framework.³⁰

Outside of unemployment and the stagflation issue, disequilibrium theory was also extended to other macroeconomic issues. For instance, Avinash Dixit, when at University of Warwick, extended Clower's dual decision hypothesis and Malinvaud's framework to international trade theory (Dixit, 1978, p. 393). It gave the basis to Dixit for promoting a "more satisfactory model of the balance of trade" than Frenkel and Johnson's (1976) monetary approach which "assumes instantaneous attainment of Walrasian equilibrium in commodity and labour markets" (Dixit, 1978, p. 393). Dixit's model would form the basis for some parts of Dixit and Norman's book on the *Theory of International Trade* (Dixit and Norman, 1980), which constituted an important reference for European

²⁷See topic 11.

²⁸Malinvaud (1977) proposed a third regime, "repressed inflation" due to excess demand in both markets.

²⁹"Important" means here highly cited by European economists in one or several cluster or topic.

³⁰Bruno and Sachs's (1985) of their late 1970s and early 1980s work constituted an highly cited resource for European macroeconomists (see also Goutsmedt et al., 2021, sec. 3).

economists working on international trade.³¹

Disequilibrium theory constituted a significant part of the research undertaken by European macroeconomists in the late 1970s and early 1980s, and did not limit to the GET, but also represented a unifying framework to deal with different macroeconomic issues (unemployment, stagflation, stabilization policies, international trade, etc.). This centrality is also visible through the fact that many macroeconomists had to position themselves in comparison to disequilibrium theory, and notably to the Keynesian versus classical unemployment framework. In May 1985 was held a conference in Sussex about European unemployment, published in *Economica* the next year.³² Macroeconomists from different countries presented their analyses of European or national unemployment. While Sneessens and Drèze estimated a “two-market macroeconomic rationing (or disequilibrium) model of the economy (Sneessens and Drèze, 1986, p. S97), Malinvaud (1986) proposed a more descriptive analysis to explain the rise of unemployment in France, even if he claimed some proximity with Sneessens and Drèze formalisation in the same issue. Malinvaud discussed some determinants of “the classical component of unemployment” (Malinvaud, 1986, p. S216), but also criticised the use of Phillips curve with a non-accelerating inflation rate of unemployment (NAIRU) to deal with the causes of unemployment. To the contrary, NAIRU was central in the model proposed by Layard and Nickell to discuss unemployment in Britain and they claimed that the “labour demand function that we use cuts through the fruitless debate now raging (especially in Europe) as to whether current unemployment is ‘classical’ or ‘Keynesian’” (Layard and Nickell, 1986, p. S121).

If not totally consensual, disequilibrium theory and the classical/Keynesian unemployment opposition were unavoidable in the mid-1980s. However, they progressively lose their influence after that period. We can observe that quantitatively both through the bibliometric and topic modelling analyses.(ref to graph in appendix (cluster and topic 11). We can also observe that indirectly in topic 25 on real wages and employment: while Malinvaud, 1977 was an important reference for the older article of the topic, it disappeared from the bibliography of the most recent articles (see appendix).) Part of the research program on disequilibrium seems to have persist in the 1990s through its most theoretical part and developed closer links with the literature on coordination and sunspots.³³ Regarding the European unemployment problem, new ways to explain it progressively emerged and have eclipsed the opposition between Keynesian and classical unemployment. That is the case of Layard and Nickell’s approach (see also Layard et al., 1991) and of the Diamond-Mortensen-Pissarides equilibrium approach (Mortensen and Pissarides, 1994; Pissarides, 1990), relying

³¹See topic 39.

³²On this episode, see Backhouse, Forder and Laskaridis, as well as Plassard and Renault, both in this issue.

³³See community on “Coordination & Sunspots 2” and graph appendix. This community was only slightly over-represented by European economists, but gathered articles mainly published in the Top 5, so it does not really constitute a European speciality.

on search.³⁴ The insider and outsider approach of the labour market also gained some popularity in Europe.³⁵ We can observe that when using the insider-outsider opposition to discuss European unemployment in 1987, Gottfries and Horn still referred to the Keynesian/classical opposition and argued in their paper that “the present unemployment may originally have arisen for Keynesian reasons, but once unemployment is created it will change the conditions under which wages are formed, thus persisting in a classical form” (Gottfries and Horn, 1987, p. 2). Lindbeck and Snower similarly cited Malinvaud (1977) and the “boundary between the ‘Keynesian’ and ‘Classical’ regimes” (Lindbeck and Snower, 1987, p. 408). This reference to Malinvaud’s framework disappear in the following years in similar works (as in Gottfries, 1992 for instance). This references was also missing in the literature about the role of firing costs and labour market flexibility in European unemployment, which became popular in the early 1990s (Bentolila and Bertola, 1990; Bentolila and Saint-Paul, 1992; Bertola, 1990).³⁶

In the late 1980s, disequilibrium theory had lost its capacity to build bridges between European macroeconomists and did not constitute a unifying theoretical language any more. What tended to unify European macroeconomists in the 1990s was not any more a theoretical framework derived from the GET and the search for microfoundations, but rather a new way to approach many macroeconomic problems through the lens of political economy.

6. A new unifying language: political economics

In its 2000 handbook, *Political Economy in Macroeconomics*, Allan Drazen defined the “new political economy” that had emerged since the 1970s by “its use of the formal and technical tools of modern economic analysis to look at the importance of politics for economics” (Drazen, 2002, p. 4).³⁷ The main question for political economy is to understand “how political constraints may explain the choice of policies (and thus economic outcomes) that different from optimal policies” (*ibid.*). In Europe, a detailed introduction to political economy was proposed by Torsten Persson and Guido Tabellini (2002).³⁸ They distinguished three traditions to which “political economics” can be “traced back” (*ibid.*): “the

³⁴REFER to community

³⁵The approach was developed notably by Nils Gottfries, Henrik Horn, Assar Lindbeck (all from the University of Stockholm) and Denis Snower from Birkbeck College (Gottfries, 1992; Gottfries and Horn, 1987; Lindbeck and Snower, 1987, 1986).

³⁶These four different approaches were central in significant European clusters and topics of the late 1980s and 1990s. See cluster “Theory of Unemployment & Job Dynamics” or topic 37 and 25.

³⁷For a history of the emergence of the “new political economy” or “new political macroeconomics” label, see Galvão de Almeida (2021).

³⁸Torsten Persson obtained his PhD in 1982 in Stockholm at the Institute for International Economic Studies under the supervision of Lars Svensson and became professor in Stockholm in 1987. Tabellini graduated in Torino before to move to UCLA for his PhD. After a first position in Stanford, he moved back in Italy in 1990. In their book, they used the term “political economics” rather than “political economy”, as the latter is too much associated with

theory of macroeconomic policy” inspired by Lucas, the public choice tradition of Buchanan, Tullock and Olson, and the formal analysis in political analysis inspired by Riker.

That is the first tradition that lies at the core of European macroeconomics in the 1990s. The integration of rational expectations in the 1970s had raised attention for policy problems. The most emblematic one is the time-consistency problem popularized by (Kydland and Prescott, 1977). The idea of Kydland and Prescott is that the optimal policy in time t is not the same as in $t + s$ as the policymaker has some interest to mislead economic agents for their own good. If agents are rational, they will anticipate in advance the policymaker’s incentive and the optimal policy is unattainable. This work asked the question of the necessity to “tie the hands” of policymakers and it has led to numerous extensions, notably about central banks, to deal with the issues of credibility, reputation (Barro and Gordon, 1983a, 1983b) or of the choice of central bankers and of the formalisation of delegation (Rogoff, 1985). This literature has clear origins in the academic US debates around rational expectations and the efficiency of macroeconomic policies in the 1970s (Hoover, 1988, pp. 80–86). But the articles cited above displayed an unusual citation trajectory: after capturing a rising share of total citations in the first years after their publication and then a decreasing share (like for many famous contributions), they have encountered a rebound and a new wave of popularity in the 1990s (Figure 10). This regain of interest is due to European economists who increasingly cited more these references than their US colleagues (Figure 11).

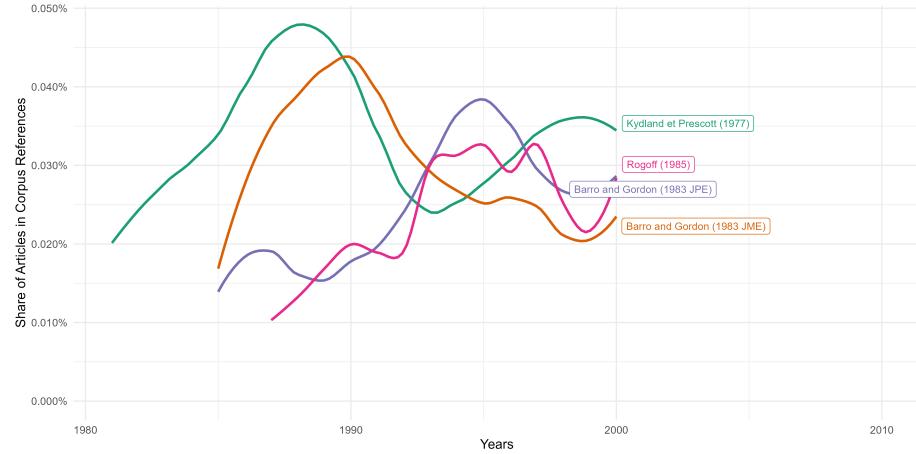


Figure 10: Share of citations of the political economy literature

“an alternative analytical approach, as if the traditional tools of analysis in economics were not appropriate to study political phenomena” (Persson and Tabellini, 2002, p. 2), which was not their point of view.

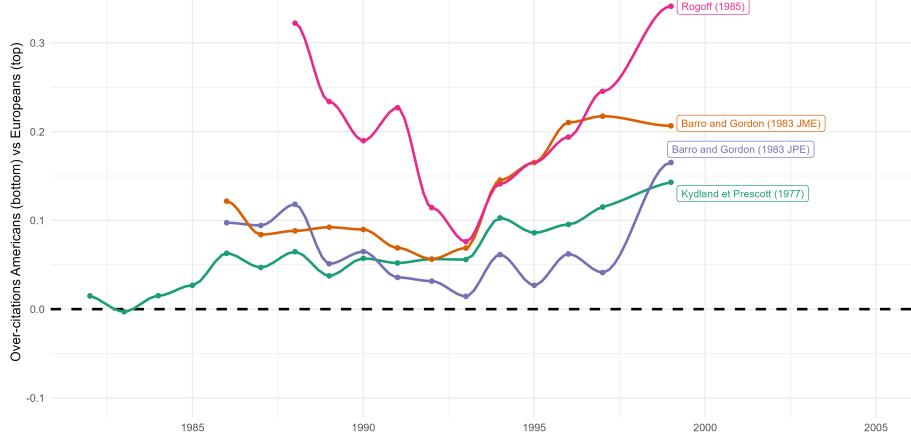


Figure 11: Citation of political economy articles by European economists relatively to US-based economists

This interest of European economists of the new political economy literature of the late 1970s and early 1980s is confirmed by the bibliometric and topic modelling analyses. We find these references as top references in different clusters and topics and they were cited by many influential European contributions.³⁹ The cluster “Political Economics of Central Banks” is one of the most European clusters while being similar in size as the cluster on “Disequilibrium & Keynesian Macro”. Similarly, the topic 8 on credibility, optimal policy and policy rule clearly represents a highly European topic. But the topic modelling allows us to observe how the new political economy literature has infused many subjects.⁴⁰

We can distinguish three areas where a political economy framework is recurrently used by European macroeconomists in the 1990s. First, and perhaps not so surprisingly, many discussions about the appropriate framework for monetary policy involved political economy contributions. An important contribution for European macroeconomics here is Giavazzi and Pagano's (1988) article published in the EER. The authors questioned the advantages of adhering to the European monetary system (EMS) for countries with higher rate of inflation. They deal with the idea that the EMS would constitute a solution to the time-inconsistency problem: it would “tie the hands” of high-inflation countries which would have to keep their exchange rate stable, thus reducing their incentive to generate surprise inflation and increasing the credibility of monetary authorities in these countries.

³⁹We mean here articles written by European authors which were highly cited in one or several topics and clusters.

⁴⁰We are able to observe that notably by looking for different topics what are the most cited references if the articles are written by European and if they are not. In many topics, the difference about the references cited is explained by the fact that Europeans refer more to political economy contributions.

The adhesion to the EMS thus “parallels that in Rogoff (1985), who shows that the non-cooperative rate of inflation can be reduced ‘through a system of rewards and punishments which alters the incentives of the central bank’” (Giavazzi and Pagano, 1988, p. 1057). The question was to know if the adhesion to the EMS would be “welfare-improving” for high-inflation countries (*ibid.*).⁴¹ Still in the EER, Daniel Laskar (1989) also started from Rogoff’s (1985) argument that appointing a conservative central banker could be beneficial for society, but extended the issue to a two-country model a discuss in which cases appointing conservative central bankers in both countries could be detrimental or beneficial to the two countries.⁴² Regarding monetary policy framework, the monetary union issue also stimulated contributions in the terms of political economy. In his EER survey about the theoretical justification for the convergence requirements of the Maastricht treaty, Paul distinguished between two types of justification: (i) “the traditional theory of optimum currency areas (OCA)” and (ii) “the more recent ‘new view’ based on credibility issues” (De Grauwe, 1996, pp. 1091–1092). Contrarily to the OCA theory, the second approach relied on the intuition of the Barro-Gordon model. It analyses “how countries can gain (or loose) credibility by joining a monetary union” and thus how inflation rates would converge.⁴³ When dealing with the monetary union issue, European macroeconomists favoured the credibility approach and the OCA theory appeared less influential. [See notably topic 3.] [Our goal is not to be fully comprehensive here. We can find another important discussion about monetary policy framework with a political economy taste on inflation targeting (see notably Svensson, 1997).]

A second area where a political economy framework was influential is the issue of wage-setting. In the EER, Henrik Horn and Torsten Persson (1988) studied the interaction between exchange rate policy and the role of unions in wage-setting. If devaluations used to maintain or increase competitiveness are followed by compensatory wage increases, the effects on competitiveness are cancelled and we are in a situation of a “devaluation-wage spiral” (Horn and Persson, 1988, p. 1621). The point of departure of the authors’ analysis is that “if wage setters are rational and forward-looking and understand the objectives behind the government’s exchange rate policy (...) they will anticipate exchange rate changes and take them into account in their wage decisions” (1622). Their goal was thus to endogenise both wage decisions and policy formation in a game-theoretic framework.⁴⁴ Thorvadur Gylfasson and Assar Lindbeck’s work on the links between wage-setting and monetary policy is also enlightening here. In a

⁴¹ Giavazzi and Pagano’s article constitutes an important reference for topic 3 and topic 8.

⁴² We can also observe another important way to approach the issue of the EMS, less empirical and a bit less framed in political economy terms, even if dealing with credibility: the expectation from going out of the EMS and thus the credibility associated to some exchange rates in a target zone or fixed rate regime (Rose and Svensson, 1994; Svensson, 1993).

⁴³ Whereas the OCA theory rather focused on the divergence in output and employment trends.

⁴⁴ Horn and Persson’s (1988) article was an important references for topic 3 (on monetary union), topic 6 (on exchange rate dynamics), topic 25 (on real wages, employment and contracts) and topic 8 (on strategic policy making issues).

1984 article in the EER, they tried to integrate together cost push and demand pull inflation in a Keynesian framework taking into account the behaviour of aggregate supply and the Phillips curve for wage formation (Gylfason and Lindbeck, 1984). As they acknowledged themselves, the issues raised by their model echoed Malinvaud's (1977) opposition between Classical and Keynesian unemployment (Gylfason and Lindbeck, 1984, pp. 6–7). Their article had a political economy flavour as they dealt with “competing wage claims” and framed their model as a duopoly problem *à la Cournot*. In their following article in the EER, they relied explicitly on game theory to deal with the interaction of wages determination and government spending (Gylfason and Lindbeck, 1986). Some years later, going back to the issue of wage setting and monetary policy, they refer to the “wage gaps” debate of the 1970s and the “cases where government efforts to reduce unemployment by bringing real wages through price inflation were frustrated by subsequent nominal wage increases” (Gylfason and Lindbeck, 1994, p. 34). They proposed a model where wages are determined “through collective bargaining among strong and well coordinated labor unions” (34) and explored its consequences for monetary policy in a game-theoretic model similar to (Barro and Gordon, 1983a, 1983b). It thus seems to us that the trajectory of Gylfason and Lindbeck work is representative of the transformation of European macroeconomics between the 1970s and the 1990s.

A third area concerns fiscal policy and European integration. Alberto Alesina, Tabellini and Persson defended in the late 1980s and early 1990s the development of a “positive theory” of fiscal policy. The two first explained in the AER that the goal was to “[abandon] the assumption that fiscal policy is set by a benevolent social planner who maximizes the welfare of a representative consumer … [for] an economy with two policymakers with different objectives alternating in office as a result of elections” (Alesina and Tabellini, 1990). Persson and Tabellini (1992) defended a similar “positive public finance” research agenda. Their goal was to understand how the rising European integration and the removal of barriers to the mobility of capital, goods and labour could affect “politico-economic equilibrium that determines fiscal policy” (Persson and Tabellini, 1992, p. 689).⁴⁵

As the three examples testify, after the late 1980s, (new) political economy and its pioneering works (Barro and Gordon, 1983a, 1983b; Kydland and Prescott, 1977; Rogoff, 1985) represented a unifying framework for many European macroeconomists to deal with different macroeconomic issues. It constituted a resource for tackling the issues raised by the European integration and the building of a European monetary system.

Conclusion

⁴⁵There references are important for European economists in Topic 36, in comparison to US-based economists. We find a distinction similar in topic 22, where US economists mainly cite endogenous growth references, when Europeans are sticking to the political economy literature.

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Appendices

A - Summary Tables

Here are the tables listing the different clusters and topics, with their synthetic indicator of how much they are “European”.

Table 1: Summary of Bibliographic Communities

Communities	Differences
Modeling Consumption & Production	2.0986873
Disequilibrium & Keynesian Macro	2.0014930
International Macroeconomics & Target Zone	1.3359739
Optimal Taxation 1	1.3235057
Political Economics of Central Banks	1.0265264
Exchange Rate Dynamics	0.7201769
Taxation, Tobin's Q & Monetarism	0.6388438
Theory of Unemployment & Job Dynamics	0.5181369
Capital & Income Taxation	0.4078902
Target Zone & Currency Crises	0.4058932
Coordination & Sunspots 2	0.3465849
Optimal Taxation 2	0.2787993
Monetary Policy, Financial Transmission & Cycles 2	0.2314883
Business Cycles, Cointegration & Trends	0.2154401
Taxation, Debt & Growth	-0.0067936
Terms of Trade & Devaluation	-0.0817679
Endogenous Growth	-0.1105033
RBC	-0.2094801
Monetary Policy, Financial Transmission & Cycles 1	-0.2379855
Coordination & Sunspots 1	-0.3313256
Exchange Rate Dynamics & Expectations	-0.4273431
Monetary Policy, Target & Output Gap	-0.6211658
REH, Monetary Policy & Business Cycles	-0.6758668
Inflation, Interest Rates & Expectations	-0.7403062
Monetary Approach of Balance of Payments	-0.7658536
Credit Rationing, Rational Expectations & Imperfect Information	-0.8270409
Inflation & Rigidities	-0.8396888
Demand for Money	-0.8564033
New Theory of Money: Search, Bargaining...	-1.2139877
Permanent Income Hypothesis & Life-Cycle	-1.4920219
Monetary Economics & Demand for Money	-1.6768415
Intergenerational Model, Savings and Consumption	-3.2194818
Marginal Taxation	-3.3179236

Table 2: Summary of topics

Topics	Differences	Terms with the highest frex value
Topic 38	0.043	europe; oecd; industrial; kingdom; european; countries
Topic 42	0.030	estimation; econometric; equivalence; hypotheses; estimated; equation
Topic 24	0.029	ems; power parity; purchasing power parity; purchasing power; target zone; exchange rate regime; rate regime
Topic 7	0.022	unemployment; labor market; job; unemployment rate; jobs; labor markets
Topic 39	0.020	real wages; real wage; employment; wages prices; nominal wage; wages
Topic 21	0.016	central bank; inflation targeting; conduct; policy rule; feedback; central
Topic 51	0.015	monetary policy; monetary fiscal policy; policy; macroeconomic policy; policy makers; policy coordination
Topic 4	0.014	current account; capital mobility; oil; speculative; mobility; account
Topic 27	0.009	international; international trade; currency; capital formation; trade; country
Topic 53	0.009	indexation; wage indexation; wage price; wage; unions; wage rate
Topic 47	0.008	aggregate demand; demand shocks; demand supply; clearing; aggregate supply; supply
Topic 12	0.006	devaluation; balance payments; payments; monetary approach; import; export
Topic 40	0.006	version; abstract; lm; consistency; index; call
Topic 37	0.005	discount rate; exchange rate; exchange rate dynamics; rate dynamics; rate determination; exchange rate determination
Topic 15	0.003	rational expectations; rational; expectations; expectations models; expectations model; price expectations
Topic 23	0.003	competition; imperfect competition; incomplete; rationing; imperfect information
Topic 32	0.003	growth; growth rate; economic growth; productivity growth; growth model; growth rates
Topic 1	0.002	crisis; financial; banking; intermediation; crises; building
Topic 10	0.002	economy; sectors; sector; growing economy; closed; growing
Topic 5	0.001	foreign exchange; exchange market; spot; foreign exchange market; intervention; foreign
Topic 41	0.001	technological; factor; productivity; intensity; education; skill
Topic 17	0.000	data; evidence; empirical evidence; time series; quarterly; series
Topic 25	0.000	short run; externalities; run; short; run equilibrium; neutrality
Topic 8	-0.001	collective; comparative; private; procedure; comparative statics; statics
Topic 16	-0.001	commodity; pricing; uniform; commodities; community; consumer
Topic 33	-0.001	fiscal policy; fiscal; budget; deficit; effects fiscal; deficits
Topic 55	-0.001	analysis; puzzle; impact; context; effects; simulations
Topic 18	-0.002	production; production function; firm; inventories; production functions; increasing returns
Topic 43	-0.002	asset; asset prices; stock market; assets; stocks; stock
Topic 6	-0.003	policies; examination; stabilization; world war; stabilization policies; cooperation
Topic 13	-0.003	money growth; money stock; money; money supply; monetary growth; transmission
Topic 48	-0.003	equilibrium model; equilibrium; walrasian; perfect foresight; foresight; transaction costs
Topic 3	-0.004	macroeconomics; political; research; review; economics; science
Topic 11	-0.004	economic; critique; economic policy; economists; economic theory; development
Topic 20	-0.004	gold; arbitrage; gold standard; forward; varying; time varying
Topic 31	-0.006	failure; decision; variations; coordination; process; uncertain
Topic 2	-0.007	economic activity; national; report; activity; national income; depression
Topic 9	-0.007	preference; risk aversion; risk; aversion; liquidity; default
Topic 26	-0.007	lump; lump sum; optimal taxation; sum; optimal tax; internal
Topic 28	-0.007	generations; overlapping generations; generations model; overlapping generations model; overlapping; multiple
Topic 29	-0.007	welfare; project; criteria; social security; security; social
Topic 50	-0.007	capital stock; accumulation; capital income; capital accumulation; capital; capital gains
Topic 52	-0.007	term structure; term; inflation; short term; expected inflation; inflation rates
Topic 34	-0.009	demand money; money demand; cash; fiat; fiat money; balances
Topic 44	-0.009	theory; classical; keynesian; monetary theory; quantity; quantity theory
Topic 14	-0.010	business cycle; business cycles; real business; real business cycle; cycles; business
Topic 36	-0.010	price; price variability; price level; relative price; price adjustment; variability
Topic 22	-0.011	robert; mundell; university; comments; robert lucas; department
Topic 45	-0.011	government spending; debt; government; government debt; spending; purchases
Topic 46	-0.011	real exchange; real exchange rate; real rate; real; real output; real income
Topic 54	-0.015	investment; local public; products; local; property; public
Topic 19	-0.016	federal reserve; federal; reserve; fed; funds; commercial
Topic 35	-0.016	tax; income tax; incidence; income taxes; tax rate; corporate
Topic 49	-0.021	income hypothesis; permanent income; permanent income hypothesis; redistribution; permanent; permanent; income distribution
Topic 30	-0.027	life cycle; utility; consumption; intertemporal substitution; utility function; life

Note:

Differences values are the sum of (i) the difference in the gamma mean between EER and Top 5; (ii) the same difference but between European-based and US-based authors

B - Information on the Methods

B.1. Corpus Creation

For the present study we used two different corpora. The first corpus is composed of all EER articles and allows us to track how publications, citations, references and authors affiliations evolved since the creation of the journal in 1969 up to the early 2000s. The second corpus is composed of all macroeconomic articles published in the top five economics journals and the EER. Macroeconomic articles are identified thanks to the former and new classification of the JEL codes (JEL, 1991).⁴⁶ This is used as the basis for topic modeling and bibliographic coupling analysis to contrast the top macroeconomics publications authored by European-based and US-based authors, and/or published in top 5 journals and in the EER.

EER Publications. For the creation of the first corpus composed of all EER articles, we used a mix of *Web of Science* (WoS) and *Scopus*. While WoS has all articles of the EER between 1969-1970 and 1974-2002, it is missing most articles published between 1971 and 1973. To make up for the missing data, we use Scopus to complete the dataset. This operation required normalization of the Scopus dataset, and manual cleaning of variables that were missing from Scopus compared to WoS. This mostly includes cleaning the references to match *Scopus* references with WoS ones, and identification of author's affiliation.

INFOGRAPHICS TO DO ALEX

Moreover, given that the size of our corpus is modest, we made an extensive semi-automatic cleaning of references to improve references identification by adding the most commonly cited books, book chapter, articles that are not otherwise identified in WoS when possible.

EER and Top 5 Macroeconomics Articles. The construction of this corpus is made in multiple steps (see Figure 12 for an illustration):

1. Identifying macroeconomics articles

- We identified all articles published in macroeconomics using JEL codes related to macroeconomics (we get JEL codes of Top 5 and EER articles thanks to the Econlit database). We consider that an article is a macroeconomics article if it has one of the following codes:
 - For old JEL codes (pre-1991): 023, 131, 132, 133, 134, 223, 311, 313, 321, 431, 813, 824.
 - For new JEL codes (1991 onward): all E, F3 and F4.⁴⁷

⁴⁶See 6 for the list of JEL codes used.

⁴⁷The new classification has a clear categorisation of Macroeconomics (the letter 'E'), but we had F3 and F4 as they deal with international macroeconomics. For the older JEL codes, we use the table of correspondence produce by the *Journal of Economic Literature* itself (JEL, 1991).

2. Using these JEL codes, we match econlit articles with WoS articles when (1) they shared the same title and year of publications, and (2) the same journal, pages, volume and year of publications. Out of the TO DO ALEX articles we get in econlit, we matched TO DO ALEX of them in WoS.⁴⁸
3. Using this list of articles in WoS, we took all articles in macroeconomics published in the EER (Corpus 1 improved with Scopus) and in the top five journals (*American Economic Review*, *Econometrica*, *Review of Economic Studies*, *Journal of Political Economy*, *Quarterly Journal of Economics*).
4. Finally, we were able to collect abstracts:
 - using *Scopus* for the EER. All abstracts have been matched with the EER corpus.
 - using *Microsoft Academics* to collect the highest number of available abstracts for the Top 5 as too many abstracts were missing in WoS or *Scopus*. The abstracts extracted from this database are matched with our WoS Top 5 corpus using journal, pages, volume and year of publications. Out of TO DO ALEX abstracts collected in the Top 5 journals, we match TO DO ALEX in WoS.

B.2. Variable creation

Authors' affiliation. Authors' affiliations information were extracted from WoS. However, the affiliations are not per author, but instead per institutional departments per paper. For example, in the case of an article with two authors from the same department, the department (and institution or country associated with it) is only counted once. Similarly, a single-authored article where the author has three affiliations can result in one article having three affiliations. While in some cases we can inferred the institutional affiliation for each author (e.g., one institution, multiple authors), in others we cannot (e.g., two institutions, three authors). For example, in an article with two authors from Princeton and one author from Stanford, we only know that the article was written by at least one author from Princeton and at least one from Stanford, but not that the individual ratio was two third.

We restructure the information in two ways.

First, for each article, we only kept one occurrence of each unique institutions (university, research institutes...) to avoid the multiplication of observations resulting from the variety of departments observed in some institutions. In other words, for each article, authors are group by their institutional affiliation not by their department or research team.

Second, and more importantly, for the purpose of our analysis, we mostly looked at the share of papers authored by European-based and US-based economists. While we do not have individual affiliation, we know with certainty when a paper has only European authors, only American authors, or a

⁴⁸Most of the unmatched articles are not ‘articles’ properly speaking: they often are reply and comments on other published articles. (Investigate this deeper)

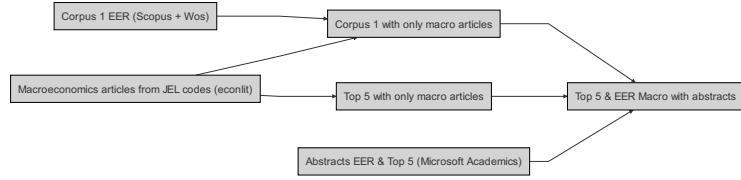


Figure 12: Construction of Corpus 2

mix of the two. For this reason, while the share of institutions within the corpus is only an estimation based on the occurrences of affiliation, the information generated to identify US authored papers and European authored paper is certain.

B.3. Bibliographic Coupling and Cluster Detection

A first way to identify potential differences between European and American macroeconomics is to find articles written by Europeans and published in European journals, resembling each others but dissimilar to American articles. To do that, we used bibliographic coupling techniques. In a bibliographic coupling network, a link is created between two articles when they have one or more references in common. The more references that two articles have in common, the stronger the link. Bibliographic coupling is one way to measure how similar two articles are in a corpus. To normalize and weight the link between two articles, we used the refined bibliographic coupling strength of Shen et al. (2019).

This method normalized and weight the strength between articles by taking into account two important elements:

- the size of the bibliography of the two linked articles. It means that common references between two articles with long bibliography are weighted as less significant since the likeliness of potential common references is higher. Conversely, common references between two articles with a short bibliography is weighted as more significant.
- the number of occurrences of each reference in the overall corpus. When a reference is shared between two articles, it is weighted as less significant if it is very common reference across the entire corpus and very significant if it is scarcely cited. The assumption is that a very rare common reference points to a higher content similarity between two articles than a highly cited reference.

For all macroeconomics articles published in the EER and in the Top 5, we build the networks with 10-year overlapping windows. This results in TO DO ALEX.

We used Leiden detection algorithm (Traag et al., 2019) that optimize the modularity on each network to identify groups of articles that are similar to each others and dissimilar to the rest of the network. We use a resolution of 1 with 1000 iterations. This results in TO DO ALEX across all networks. Because networks have a lot of overlaps, many clusters between two periods are composed of the same articles. To identify these clusters that are very similar between two time windows, we considered that (*i*) if at least 55% of the articles in a community of the first time window were in the same cluster in the second time window, and that (*ii*) if the cluster was also composed by at least 55% of articles of the first time window, *then* it is the same cluster

Simply put, if two clusters share a high number of articles, and are both mostly composed by these shared articles, they are considered the same cluster.

This gives us TO DO ALEX, with TO DO ALEX that are at least 5% of a network at any given point and are stable enough to exists for at least two time windows.

For each of these clusters, we computed the share of articles published in the top 5 journals vs the EER, and the share of articles authored by European vs American for the time window of the cluster. We then subtracted the share of articles published in the EER in the cluster with the share of articles published in the EER on the same time period of the cluster to identify over/under representation of the EER. We also subtracted the relative share of European authors to American authors in the cluster to the relative share of European authors to American on the same time period of the cluster to identify over/under representation of European authors in the cluster.

Finally, we plotted the clusters on a scatterplot to identify clusters in which both European authors and the EER are over-represented.

B.4. Topic Modelling

Preprocessing. We have several steps to clean our texts before running our topic models:

1. Once we have our corpus, we merge titles and abstracts together for all EER and Top 5 articles.
2. We use the *tidytext* and *tokenizers* R packages to ‘tokenise’ the resulting texts (when there is no abstract, only the title if thus tokenise)?⁴⁹ Tokenisation is the process of transforming human-readable text into machine readable objects. Here, the text is split in unique words (unigrams), bigrams (pair of words) and trigrams. In other words, to each article is now associated a list of unigrams, bigrams and trigrams, some appearing several times in the same title + abstract.
3. Stop words are removed using the *Snowball* dictionary.⁵⁰ We add to this dictionary some current verbs in abstract like “demonstrate”, “show”, “explain”. Such verbs are likely to be randomly distributed in abstracts, but we want to limit the noise as much as possible.
4. We lemmatise the words using the *textstem* package.⁵¹ The lemmatisation is the process of grouping words together according to their “lemma” which depends on the context. For instance, different form of a verb are reduced to its infinitive form. The plural of nouns are reduced to the singular.

Choosing the number of topics. We use the Correlated Topic Model (Blei and Lafferty, 2007) method implemented in the *STM* R package.⁵²

From the list of words we have tokenised, cleaned and lemmatised, we test different thresholds and choices by running different models:

- by excluding trigrams or not;
- by removing the terms that are present in less than 0.5% of the Corpus (17), 1% (34) and 2% (68);
- by removing articles with less than 6 words or with less than 12 words.⁵³

Crossing all these criteria, we thus have 12 different possible combinations. For each of these 12 different combinations, we have run topic models for different number of topics from 20 to 110 with a gap of 5. The chosen model integrates trigram, removes only terms that appear in less than 0,5% of the documents and keep all articles if they have more than 6 words in their title + abstract. We choose to keep the model with 55 topics.

⁴⁹See Silge J, Robinson D (2016). “tidytext: Text Mining and Analysis Using Tidy Data Principles in R.” *JOSS*, 1(3) and Lincoln A. Mullen et al., “Fast, Consistent Tokenization of Natural Language Text,” *Journal of Open Source Software* 3, no.23 (2018): 655.

⁵⁰See <http://snowball.tartarus.org/algorithms/english/stop.txt>.

⁵¹Rinker, T. W. (2018). *textstem*: Tools for stemming and lemmatizing text version 0.1.4. Buffalo, New York.

⁵²Roberts ME, Stewart BM, Tingley D (2019). “stm: An R Package for Structural Topic Models.” *Journal of Statistical Software*, 91(2), 1-40.

⁵³Here, only articles with no abstract are impacted.

We have chosen the criteria and the number of topics by comparing the performance of the different models in terms of the FREX value (Bischof and Aioldi, 2012).