What is the reach of the credibility revolution?

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Abstract

In the last 25 years, there has been an abrupt change in the methodology followed by economists. Authors like Angrist and Pischke call this change the "credibility revolution". This revolution consists of the use of experimental or quasi-experimental methods and mainly reached the high impact academic journals of Economics such as *The Quarterly Journal of Economics*, *American Economic Review* and *Econometrica*, among others. Until now, the scope of the revolution has not been analyzed in academic journals associated with heterodox economics schools. The objective of this article is to explore with a bibliometric analysis if there was a similar change in journals with the main influence of the Marxist, Austrian, and Post-Keynesian school of thought. The result of this exercise suggests that this type of journal did not witness a credibility revolution as such. Finally, we explore the reasons why this result occurs.

Introduction

For a long time, a large part of the hypotheses formulated in Economics was not accompanied by empirical tests that constituted evidence in their favor. In the cases in which the hypotheses were empirically tested, no greater relevance was given to obtaining true causal effects. Empirical work carried out in the 1970s and 1980s that attributed causal character to relationships found from simple regression analyses (see, for example, Ehrlich 1973) elicited numerous criticisms (Leamer 1983) and led to to a debate on the validity of the identification of causal effects in the discipline.

Since then, discussions about the validity of the empirical results found gave special emphasis to the potential problems of bias due to the omission of variables or bias due to self-selection. This led to great efforts aimed at solving this type of endogeneity problems, to obtain causal knowledge. For example, the literature that studies the causal effect of education on income must deal with the fact that the innate ability of individuals can positively affect both income and levels of education. The non-observability of the ability implies that the results obtained about the returns to education are possibly biased and cannot be interpreted causally.

As Angrist and Pischke 2010 and before Leamer 1983 commented, randomized controlled experiments or *randomized control trials* are the ideal that would allow us to make comparisons under *ceteris paribus* conditions. Randomness reduces the probability that the explanatory variable of interest is related to the other determining factors of the explained variable, which constitutes a solution to the problem of bias due to omitted variable and allows to attribute a causal character to the relationships found between the variables. However, sometimes it is very expensive or immoral to carry out this type of experiment, so it is often resorted to the use of natural experiments or quasi-experimental designs to obtain reliable causal knowledge.

Various areas in economics were reached by the so-called "credibility revolution", including development economics, labor economics, crime economics, and behavioral economics. Even in macroeconomics, efforts were made to use this type of methodologies; In Richardson and Troost 2009, for example, a **natural experiment** was used to analyze the impact of monetary policy on the real economy which would indicate that it is possible to answer some macroeconomic questions with the appropriate natural experiments. The objective of the present work is to investigate whether the revolution also reached economic currents recognized as heterodox, such as Austrian economics, Post-Keynesian, and Marxist. For this, a simple bibliometric analysis is carried out, which consists of reviewing the number of articles published in heterodox journals that use words related to experimental or quasi-experimental tools. Then, it is analyzed if there is a trend in use similar to that in high-impact academic journals.

Credibility revolution

The work of Leamer 1983, entitled *"Let's Take The Con out of Econometrics"* was the kick to put an important problem in economics at the center of the debate: when the theory was accompanied by empirical testing, the evidence collected was rarely considered credible or of "good quality". This made it difficult to justify the support for certain theories, and also the comparison of alternative models that tried to explain the same phenomenon. Until then and for some time after publication, the validity of the results obtained was evaluated based on secondary aspects such as their robustness to changes in the functional forms that described the relationship between the explained and explanatory variables. (Angrist and Pischke 2010, p. 9). This removed the focus from a different and even more relevant problem, which was to ensure that the variability of the regressors of interest was not related to the other explanatory factors that could not be observed or measured.

There are several ways to ensure that the variability of the regressors of interest is not related to factors that cannot be observed or that cannot be measured. One of them is to guarantee that the source of variability is pure chance, which can be achieved with so-called ***randomized control trials*** **(RCT)**. RCTs are a type of experiment that consists of randomly assigning treatment or control states to individuals, to measure the different responses that individuals present concerning the variables to be explained. Whether due to the nature of the cause-effect relationship to be analyzed or due to resource constraints, this type of experiment cannot always be carried out. Alternative ways of obtaining causal knowledge consist of the design of quasi-experiments (Panhans and Singleton 2017). One tool for this is the **instrumental variables** method, which consists of looking for a source of exogenous variability for the causal variable of interest. On certain occasions, it is possible to find variables that are correlated with the variable of interest, but that at the same time is not correlated with the variable to be explained by another channel than the variable of interest. This type of variable provides exogenous variation to the variable of interest, thus eliminating the self-selection bias.

Another tool widely used in the quasi-experimental design is the **discontinuous regression** method, very common in evaluating the impact of public programs. In this type of program, the causal variable of interest is a treatment, and it is desired to analyze its impact on a certain outcome variable. These programs sometimes assign continuous indices or scores to individuals and then determine each individual's eligibility using a cutoff score. Around this cutoff score, eligible (treatment group) and ineligible (control group) individuals present similar characteristics, and for this reason, the allocation of treatment can be considered random. The unbiased estimation of the effect of the program can be carried out locally with the set of observations close to the cutoff score.

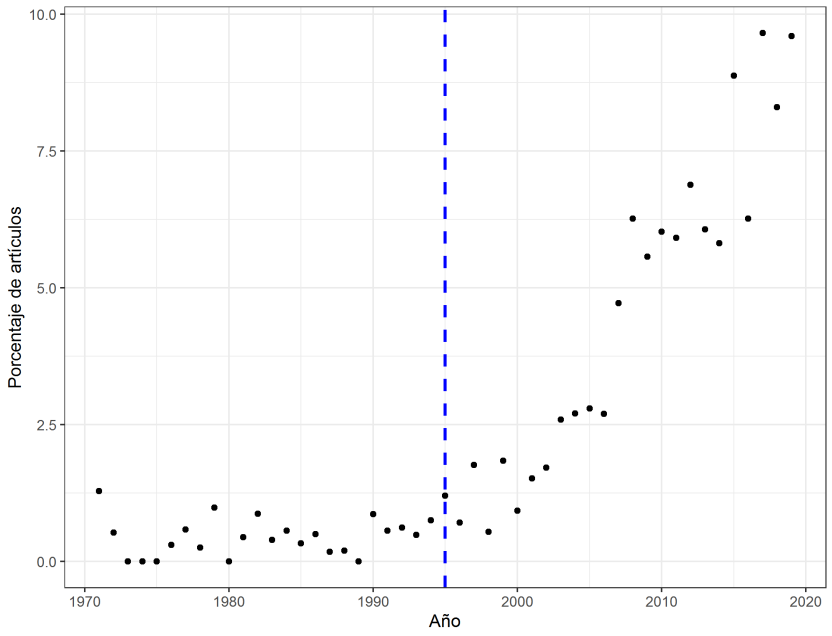

Figure 1: Replica of Panhans and Singleton (2017)

When no instrumental variable is available and a discontinuous regression cannot be performed, it is still possible to eliminate selection bias using the **differences in differences** method. This tool can be used when, in the absence of treatment, treated and untreated individuals show parallel trends for the response variable of interest. In these cases, although the treatment is not assigned by chance among the individuals, it is possible to observe how the treated group evolves to compare this evolution with the trend that it would have had in the absence of treatment.

Hamermesh 2013 performs a qualitative analysis of the articles published in the top 3 academic journals of Economics between the 1960s and 2010s, and finds that towards the end of the period under study many more empirical works and laboratory experiments or field were published. However, various works document the great increase in the use of experimental methods (Ravallion 2020) as quasi-experimental (Panhans and Singleton 2017) only after 1995. As an illustration, a replica of the Results obtained by Panhans and Singleton 2017, can be seen in the Figure 1. In their work, the authors show how the proportion of articles that name some of the following terms in their title or summary evolves: *"randomized control trial", "difference-in-differences", "instrumental variable "* and *"regression discontinuity"*. They carry out the analysis considering 12 high-impact journals in economics. Two fewer journals were used than in the case of Panhans and Singleton because they were not available in Dimensions. The results are not affected by this omission. The exercise is repeated for the same journals using the words " *control group*", "*identification strategy*" and "*research design*" (Angrist and Pischke 2010, p. 12) obtaining a similar result (Figure 2).

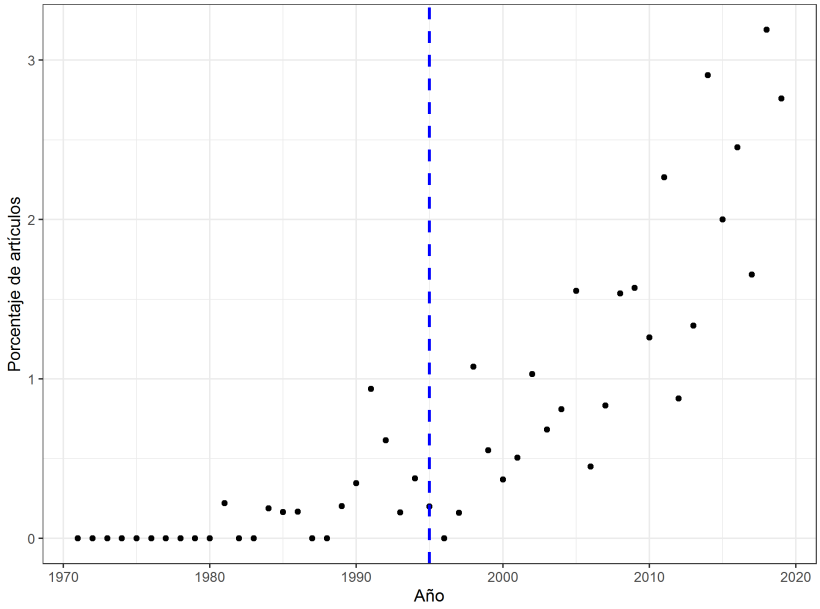

Figure 2: Replica of Panhans and Singleton (2017) using another group of words

Data and methodology

The data used in our bibliometric exercise was obtained through Dimensions, a web resource similar to Google Scholar, Web of Science, and Scopus. It contains information on numerous academic journals, their articles, abstracts, number of citations, among others. Regarding its scope, there is evidence to suggest that Dimensions is similar to Web of Science and Scopus but inferior to Google Scholar (Harzing 2019, Thelwall 2018).

After selecting the relevant journals for our analysis, it was verified whether the titles and abstracts of the articles published in them contained a series of keywords. In order to verify the performance of the Dimensions search engine, various summaries, and titles provided by Dimensions were scrapped with an algorithm, an identical result was reached to that obtained using the platform's search engine. The keywords were divided into two groups. The first group contains *"randomized control trial", "difference-in-differences", "instrumental variable"* and *"regression discontinuity"* (the choice of these keywords was based on the work of Panhans and Singleton 2017) and the second group contains *"control group"* and *"identification strategy", "research design"* (based on Angrist and Pischke 2010).

Both the number of articles analyzed for each case as well as the number of journals and the years contemplated (based on the availability of articles) can be seen in the Table 1.

Table 1: Data

Economic school of thought	Articles	Journals	Years covered
Austrian economics	2,176	4	1983 - 2019
Post-keynesian economics	6,991	4	1971 - 2019
Marxist economics	7,862	6	1971 - 2019
General heterodoxy	36,577	26	1971 - 2019

Heterodox economics

Austrian economics

The Austrian School of Economics was born around 1870 and its first exponent was the economist Carl Menger (Rutherford 1995). Although in the beginning this school was made up of authors from Austria such as Böhm-Bawerk and Wieser, today it has references from different countries. The best known include Hayek, Mises, Rothbard, Block, Hazlitt, Machlup, Kirzner, Garrison, Schiff, and Leeson.

Based on Block 2010 4 journals are selected that, those journals, have content mostly related to authors from the Austrian School: Advances in Austrian Economics, Review of Austrian Economics, Journal of Public Finance and Public Choice, Quarterly Journal of Austrian Economics.

The result obtained with the exercise indicates that, of a total of 2,176 articles, there is only 1 article between 1983 and 2019 that uses one of the terms from group 1 and another article in the same period that uses one of the terms from group 2.

Post-keynesian economics

The Post-Keynesian school of thought made advances on John Maynard Keynes's work, but at the same time extends outside of it. Some exponents of the Post-Keynesian school are economists like Davidson, Robinson, Minsky, Lavoie, Lee, among others. The topics they address are varied; among the most relevant are studies on price formation, financial instability, capital formation, and income policies.

To analyze the Post-Keynesian school of thought, the following 4 academic journals were taken based on Lavoie 2009, p. xiii: Cambridge Journal of Economics, Journal of Post Keynesian Economics, Review of Political Economy and Review of Radical and Political economics.

The exercise shows that, of a total of 6,991 articles, none use the terms included in

group 1 for the period 1971-2019. Likewise, only 1 article was found that uses a term from the second group for the same period of analysis.

Marxist economics

Marxist Economics deals with the application of Marx's theories of value and exploitation to the theory of prices, competition, and the functioning of modern capitalist economies (Rutherford 1995). Some exponents of this trend are Dobb, Meek, Shaikh, and Sweezy, among others.

The same analysis was carried out for 7,862 studies related to Marxist Economics for the period 1971-2019. Finding journals related to Marxist Economics is not trivial; Based on those available on the *Dimensions* platform, the following 6 journals were selected: Capital & Class, Rethinking Marxism, Historical Materialism, Marxism 21, Contributions to Political Economy, Research in Political Economy.

The result suggests, as in the previous cases, that the credibility revolution did not occur in the academic journals related to Marxism since the results were null in terms of articles using the experimental and/or quasi-experimental terms. included in the first group of words. Likewise, only one article was found that uses a word contained in the second group.

General heterodoxy

In this section, journals from various school of thoughts considered unorthodox were included to provide a more general panorama of the evolution in the use of the selected keywords. The problem of defining a school of thoughts as heterodox or outside the "*mainstream*" is not trivial. A possible classification may arise from (Backhouse 2000), however, the problem will not be addressed here. The list of journals analyzed can be consulted in the appendix; They were selected based on the directory edited and compiled by Jo 2013.[1]

The same exercise is carried out as in previous sections on a total of 26 journals and 36,577 articles for the period 1971-2019. The results obtained when considering the first group of words can be seen in the Figure 3. It is found that within the heterodox school of thoughts there seems to be a noticeable increase in the proportion of articles that make use of terms related to experimental or quasi-experimental tools. The increase was approximately in 2011 and the highest proportion was in 2017, with 0.7 % of articles using the terms. We consider this proportion too low when comparing it with the results obtained by Panhans and Singleton (2017). It is relevant to mention that, of the 26 journals analyzed, 12 did not have articles with any of the terms in the

[1]The online version can be found at the following link.

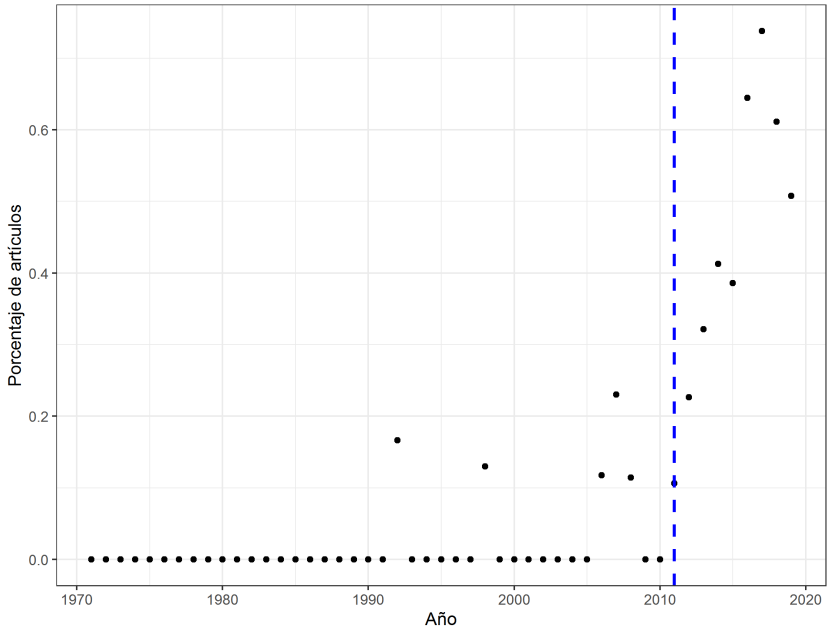

Figure 3: Heterodox journals and quasi-experimental methods

period analyzed. However, those journals that did experience an increase in this type of methodologies went through what we call a late credibility revolution.

Considering the second group of words, the result is similar and can be seen in the Figure 4. There is a certain increase in the use of the terms as of 2011, however, it is not significant. The latter suggests that there was practically no credibility revolution in the journals analyzed.

Explaining results

At first glance the results may seem surprising, however there is some evidence that heterodox schools would not follow a path similar to conventional economics. This section will briefly examine the methodology promoted by the various schools as a way of trying to understand why there appears to be a lack of a credibility revolution.

Austrian economics

There is ample evidence that Austrian economists tend to reject empirical hypothesis testing, and because the credibility revolution refers to empirical economics, this could explain why no such change occurred. Some examples of Austrian economists who reject empirical testing can be seen in Menger, Antiseri, and Fuente 2006, Von Mises 2016, Machlup 1955, Kirzner 1990, De Soto 1999, etc. While some Austrian economists

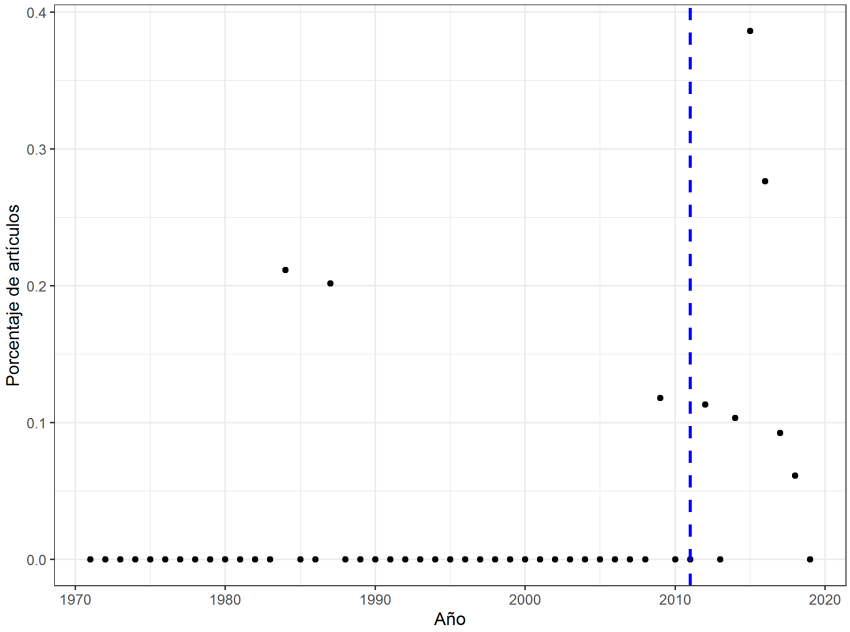

Figure 4: Heterodox journals and the second group of words

like Mises directly rejected empirical testing, others like Machlup take a more moderate stance simply by rejecting direct empirical testing of assumptions. Some examples illustrating the ideas of various Austrian economists:

- "Austrian economic analysis is carried out largely on the basis of theoretical, deductive reasoning; empiricism has little place in Austrian economic theory." (Taylor 1980).
- "The theorems attained by correct praxeological reasoning are not only perfectly certain and incontestable, like the correct mathematical theorems. They refer, moreover with the full rigidity of their apodictic certainty and incontestability to the reality of action as it appears in life and history. Praxeology conveys exact and precise knowledge of real thing" (Von Mises 1996).
- "Testing the exact theory of economy by the full empirical method is simply a methodological absurdity, a failure to recognize the bases and presuppositions of exact research" (Menger 1996).

Post-keynesian economics

It is common in the Post-Keynesian tradition that many authors emphasize the realism of the models (see Lee 1999, Keen 2011 and Lavoie 2014). It is therefore rare that they do not tend to adopt more rigorous methods when it comes to empirical

analysis. In fact, a significant part of the Post-Keynesian literature is based on evidence from surveys of firms (see Lee 1999, Downward 2000 and Lee 1994).

This result seems to show that while there is enthusiasm for empirical testing, this enthusiasm is maintained at an early stage in which the evidence used is weak evidence at best.

Some examples illustrating the ideas of Post-Keynesian economists:

- "While post-Keynesian theory, like neoclassical theory, has microeconomic foundations, its theoretical foundation is different and, in many ways, more realist." (Lavoie 2009).

- "Realism, in fact, is a central methodological emphasis of this school. Though there is no agreed post-Keynesian methodology to rival the hedonistic calculus of the neoclassicals, post-Keynesians are united by their belief that an economic model has to be realistic." (Keen 2011).

- "Thus, whereas it would appear that Post Keynesian economics is in a state of anarchy, it is in fact not so, because Post Keynesian economists have a common reference point that of engaging in work which moves the Keynesian analysis forward to encompass more realistic analyses of pricing, distribution, investment and dynamic growth paths, both long-run steady state and short-period disequilibrium..." (Lee 1999).

Marxist economics

Unlike other schools, Marxist economics does not usually have such explicit discussions about methodology. For example, for some authors like Elster and Jon 1986, it seems it is easier to describe that it is not the Marxist methodology than to describe what it is. For someone not used to it, the reading about Marx can seem confusing since Hegelian terms are used in part and the Marxist vocabulary itself. Lebowitz 2009 argues that for Marx he held that the "scientific truth" cannot be reached by induction or empiricism. Rather, abstraction was necessary because scientific laws revealed nothing but appearances.

Sweezy, Laborde, et al. 1945 agrees with Lebowitz 2009 when he says that the Marxist method is based on abstraction, a process by which it appears that economic phenomena can be understood. Ultimately, one might think that Marxism did not have a credibility revolution because Marx from the beginning did not place so much emphasis on the empirical contrast of hypotheses. Here are some quotes that attempt to summarize the Marxist position.

- "Marx was a staunch supporter of the abstract-deductive method that was such a striking feature of Ricardo's school. In the analysis of economic forms - he wrote in the preface to Capital - neither the microscope nor chemical reagents

are useful. The force of abstraction must replace one and the other." (Sweezy, Laborde, et al. 1945).[2]

- "The method of rising from the abstract to the concrete is the only way in which thought appropriates the concrete, reproduces it as the concrete in the mind." (Marx 2005).
- "The 'scientifically correct method', Marx declared in the Grundrisse, begins with the 'simplest determinations' and concepts from which we can logically deduce a conception of the whole not as chaos but as 'a rich totality of many determinations and relations'." (Lebowitz 2009).

What has been written above allows us to understand at least partially the absence of a credibility revolution in heterodox schools similar to that of mainstream journals. However, the analysis can be expanded in later studies.

Limitations

A summary of the results can be found in the Table 2. It is necessary to clarify that

Table 2: Summary of Results

Economic school of thought	**Amount of articles found**	
	First group of words	Second group of words
Austrian economics	1	1
Post-keynesian economics	0	1
Marxist economics	0	1
General heterodoxy	65	16

the results obtained can lead to a wrong conclusion for various reasons. Two of them are listed below:

- The methods related to the credibility revolution are not described in the titles or abstracts of the analyzed articles, but rather in their body. This would imply that the exercise fails to capture the methodological change since only abstracts and titles were analyzed.
- Perhaps the methods adopted by the different schools do show improvements in terms of credibility, but these methods may not be those mentioned by those

[2]Translated from spanish

authors who characterize the "credibility revolution". That is, perhaps the methods used in high-impact journals are not the same as those used by the journals analyzed here.

- When dimensions have no abstract information, it fails to suggest that there are no words in the abstract. This reduces the number of articles analyzed.

Conclusions

In this work, an attempt was made to search within heterodox currents for something similar to the phenomenon called the "credibility revolution" that has taken place within the most prestigious economics magazines. A bibliometric analysis of the abstracts and titles of various publications in Austrian, Post-Keynesian, and Marxist journals failed to capture a similar methodological change. The same analysis was carried out including journals that fall within a more general category, which we call "Heterodox economics". The results suggest that something that could be understood as an attenuated and late credibility revolution seems to have begun in various heterodox school of thoughts, however, this result is not clear since the proportion of journals that refer to these methodologies is too low.

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Appendix

Non-mainstream journals

The non *mainstream* journals used in the section on general heterodoxy are the following:

Journal of Economic Issues, American Journal of Economics and Sociology, Review of Radical Political Economics, International Journal of Social Economics, Review of Social Economy, Cambridge Journal of Economics, Economy and Society, Journal of Post Keynesian Economics, Metroeconomica, Review of Political Economy, International Review of Applied Economics, Brazilian Journal of Political Economy, Competition & Change, Contributions to Political Economy, Economic Systems Research, Economia e Sociedade, European Journal of Economics and Economic Policies Intervention, Feminist Economics, Forum of social Economics, International Journal of Pluralism and Economics Education, International Journal of Political Economy, Journal of Heterodox Economics, Journal of Institutional Economics, PSL Quarterly Review, Panoeconomicus, Review of Keynesian Economics y Socio-Economic Review.