UNIVERSIDADE FEDERAL DO PARANÁ

VICTOR NUNES LEAL CRUZ E SILVA

ESSAYS ON THE INTERDISCIPLINARITY BETWEEN ECONOMICS AND THE NEIGHBORING SOCIAL SCIENCES: HISTORIOGRAPHY, MEASUREMENT AND NORMATIVITY

CURITIBA

2019

VICTOR NUNES LEAL CRUZ E SILVA

ESSAYS ON THE INTERDISCIPLINARITY BETWEEN ECONOMICS AND THE NEIGHBORING SOCIAL SCIENCES: HISTORIOGRAPHY, MEASUREMENT AND NORMATIVITY

Tese apresentada como requisito parcial para obtenção do título de Doutor através do Programa de Pós-Graduação em Desenvolvimento Econômico, Setor de Ciências Sociais Aplicadas, da Universidade Federal do Paraná.

Orientador: Prof. Dr. Marco Antônio Ribas Cavalieri

CURITIBA

2019

FICHA CATALOGRÁFICA ELABORADA PELA BIBLIOTECA DE CIÊNCIAS SOCIAIS APLICADAS – SIBI/UFPR COM DADOS FORNECIDOS PELO(A) AUTOR(A)
Bibliotecário: Eduardo Silveira – CRB 9/1921

Silva, Victor Nunes Leal Cruz e
Essays on the interdisciplinarity between Economics and the neighboring Social Sciences: historiography, measurement and normativity / Victor Nunes Leal Cruz e Silva. - 2019.
104 p.

Tese (doutorado) - Universidade Federal do Paraná, Setor de Ciências Sociais Aplicadas, Programa de Pós-Graduação em Desenvolvimento Econômico.

Orientador: Marco Antônio Ribas Cavalieri.

Defesa: Curitiba, 2019.

1. Interdisciplinaridade. 2. Economia. 3. Ciências Sociais. 4. Bibliometria. I. Universidade Federal do Paraná. Setor de Ciências Sociais Aplicadas. Programa de Pós-Graduação em Desenvolvimento Econômico. II. Cavalieri, Marco Antônio Ribas. III. Título.

CDD 330

MINISTÉRIO DA EDUCAÇÃO
SETOR DE CIENCIAS SOCIAIS E APLICADAS
UNIVERSIDADE FEDERAL DO PARANÁ
PRÓ-REITORIA DE PESQUISA E PÓS-GRADUAÇÃO
PROGRAMA DE PÓS-GRADUAÇÃO DESENVOLVIMENTO ECONÔMICO - 40001016024P0

TERMO DE APROVAÇÃO

Os membros da Banca Examinadora designada pelo Colegiado do Programa de Pós-Graduação em DESENVOLVIMENTO ECONÔMICO da Universidade Federal do Paraná foram convocados para realizar a arguição da Tese de Doutorado de **VICTOR NUNES LEAL CRUZ E SILVA**, intitulada: **ESSAYS ON THE INTERDISCIPLINARITY BETWEEN ECONOMICS AND THE NEIGHBORING SOCIAL SCIENCES: HISTORIOGRAPHY, MEASUREMENT, AND NORMATIVITY**, sob orientação do Prof. Dr. MARCO ANTONIO RIBAS CAVALIERI, após terem inquirido o aluno e realizado a avaliação do trabalho, são de parecer pela sua APROVAÇÃO no rito de defesa.

A outorga do título de Doutor está sujeita à homologação pelo colegiado, ao atendimento de todas as indicações e correções solicitadas pela banca e ao pleno atendimento das demandas regimentais do Programa de Pós-Graduação.

Curitiba, 16 de Julho de 2019.

MARCO ANTONIO RIBAS CAVALIERI
Presidente da Banca Examinadora

EDUARDO ANGELI
Avaliador Interno (UNIVERSIDADE FEDERAL DO PARANÁ)

RAMON VICENTE GARCIA FERNANDEZ
Avaliador Externo (FUNDAÇÃO UNIVERSIDADE FEDERAL DO ABC)

DENILSON ALDINO BEAL
Avaliador Externo (TRIBUNAL DE CONTAS DO ESTADO DO PARANÁ)

ADRIANO NERVO CODATO
Avaliador Externo (UNIVERSIDADE FEDERAL DO PARANÁ)

Aos dias que fizeram do mundo um lugar
em que vale a pena viver: 08/05/1928,
20/10/1959 e 07/01/1994.

"Speech has allowed our communication of ideas, enabling human beings to work together to build the impossible. Mankind's greatest achievements have come about by talking and its greatest failures by not talking. Our greatest hopes could become reality in the future. All we need to do is make sure we keep talking." (Stephen Hawking).

RESUMO

O objetivo dessa tese é encadear três ensaios independentes sobre a relação de interdisciplinaridade que a ciência econômica mantém com as demais ciências sociais. Esses ensaios apresentam-se na condição de um conjunto de pesquisa linear. Essa pesquisa se inicia com um ensaio que faz um levantamento bibliográfico dos trabalhos em economia que tocam o tema interdisciplinaridade a partir de múltiplas perspectivas, apresentando também alguns números interessantes em relação à literatura econômica sobre o tema. O segundo ensaio se aprofunda na questão bibliográfica e faz um esforço bibliométrico para mensurar a evolução da interdisciplinaridade na rede das ciências sociais. Esse ensaio busca, através da análise de citações, entender como os padrões de interdisciplinaridade entre as ciências sociais variam ao longo do tempo e se essas ciências se aproximam ou se distanciam a partir dos anos 1950. O terceiro ensaio, finalmente, se configura em uma defesa normativa da economia enquanto ciência social interdisciplinar. O argumento lançado nesse ensaio é circunstanciado na filosofia da ciência de Laurence BonJour, chamada de coerentismo. Seu objetivo é defender que a economia se tornaria mais epistemologicamente apta a explicar os fenômenos sociais que lhe interessam se o seu corpo teórico abrisse espaço para teorias e métodos oriundos das demais ciências sociais.

Palavras-chave: Interdisciplinaridade. Ciências Sociais. Bibliometria. Análise de citação. Normatividade. Coerentismo.

ABSTRACT

The objective of this dissertation is to link three independent essays on the relation of interdisciplinarity economics maintains with the neighboring social sciences. These essays are presented in the condition of a linear research set. This research begins with an essay that performs a bibliographical survey of the economics works touching the subject of interdisciplinarity from manifold perspectives. This essay also presents some insightful numbers regarding the economics literature on the topic. The second essay delves into the bibliographic question and performs a bibliometric effort to measure the evolution of interdisciplinarity within the social sciences network. This essay seeks, through citation analysis, to understand how the interdisciplinarity patterns between the social sciences vary across time and whether these disciplines get closer or farther away from the 1950s onwards. The third essay, at last, answers for a normative defense of economics as an interdisciplinary social science. The argument laid down on this essay is substantiated on Laurence BonJour's philosophy of science, the so-called coherentism. Its objective is to defend that economics would become more epistemologically able to explain the social phenomena concerning the discipline if its theoretical body opened more space to theories and methods germane to the neighboring social sciences.

Keywords: Interdisciplinarity. Social Sciences. Bibliometrics. Citation Analysis. Normativity. Coherentism.

LISTA DE ABREVIATURAS E SIGLAS

AA	-	American Anthropologist
AER	-	The American Economic Review
APSR	-	American Political Science Review
ASR	-	American Sociological Review
CIA	-	Coefficient of Interdisciplinary Asymmetry
PR	-	Psychological Review
JCR	-	Journal Citation Reports
T25	-	Top 25 Journal Ranking
WoS	-	Web of Science

LISTA DE GRÁFICOS

LISTA DE TABELAS

SUMÁRIO

1. INTRODUCTION

Julie Thompson Klein (2010, p. 16-18, 24) defines interdisciplinarity as the proactive interaction between disciplines that integrates designs and allows disciplinary approaches to be restructured. In this fashion, this dissertation espouses the belief that economics should be a more interdisciplinary social science.

This belief departs from two recognitions. First, the recognition that economics is essentially a social discipline (BACKHOUSE & FONTAINE, 2010, p. 3, 6; BOULDING, 1948, p. 199; GRUCHY, 1947, p. 26; HERFELD & DOEHNE, 2018, p. 316; MITCHELL, 1937, p. 289; SCHUMPETER, 2006 [1954], p. 23-24). Second, in line with Millis, Johnson, and Barnett's (1931, p. 286) report on the Social Science Research Council, the acknowledgment that "[…] social problems […] cannot be adequately analyzed through the contributions of any single discipline." Accordingly, the three essays in this dissertation aim at discussing different aspects of the interdisciplinarity between economics and the neighboring social sciences.

The essays are independent research pieces intended to integrate a cohesive whole. These research pieces proceed from a bibliographical survey to a normative defense of economics as an interdisciplinary social science, also covering a bibliometric appreciation of economics' interdisciplinarity patterns. The overall objective is (a) to present the literature on the subject; (b) to understand the place the social sciences occupy in economics, and; (c) to defend that economic reasoning should be closer to the neighboring social disciplines.

The first essay presents the literature relating economics and the social sciences from manifold perspectives. Its objective is to survey how the economics literature held these discussions hitherto. This is intended to map the literature on the topic and to extract some insightful numbers from it, such as the temporal evolution of the subject, the journals responsible for publishing these interdisciplinary discussions, and the sort of treatment we find to be more usual.

The second essay performs a citation analysis in the fashion of Rigney and Barnes (1980), Pieters and Baumgartner (2002), Fourcade, Ollion, and Algan (2015), and Angrist et al (2017). It is an attempt to understand whether economics has become more open to knowledge developed in the neighboring disciplines or not. This essay also aims at establishing an asymmetry measure that informs how the social sciences evolved in their relevance to each other's interdisciplinary citations. It is, therefore, a bibliometric study. In addition, we believe history of economics has much to profit from the application of quantitative techniques, as do

Cherrier and Svorencik (2018), Claveau and Gingras (2016), Claveau and Herfeld (2018), and Edwards, Giraud, and Schinckus (2018).

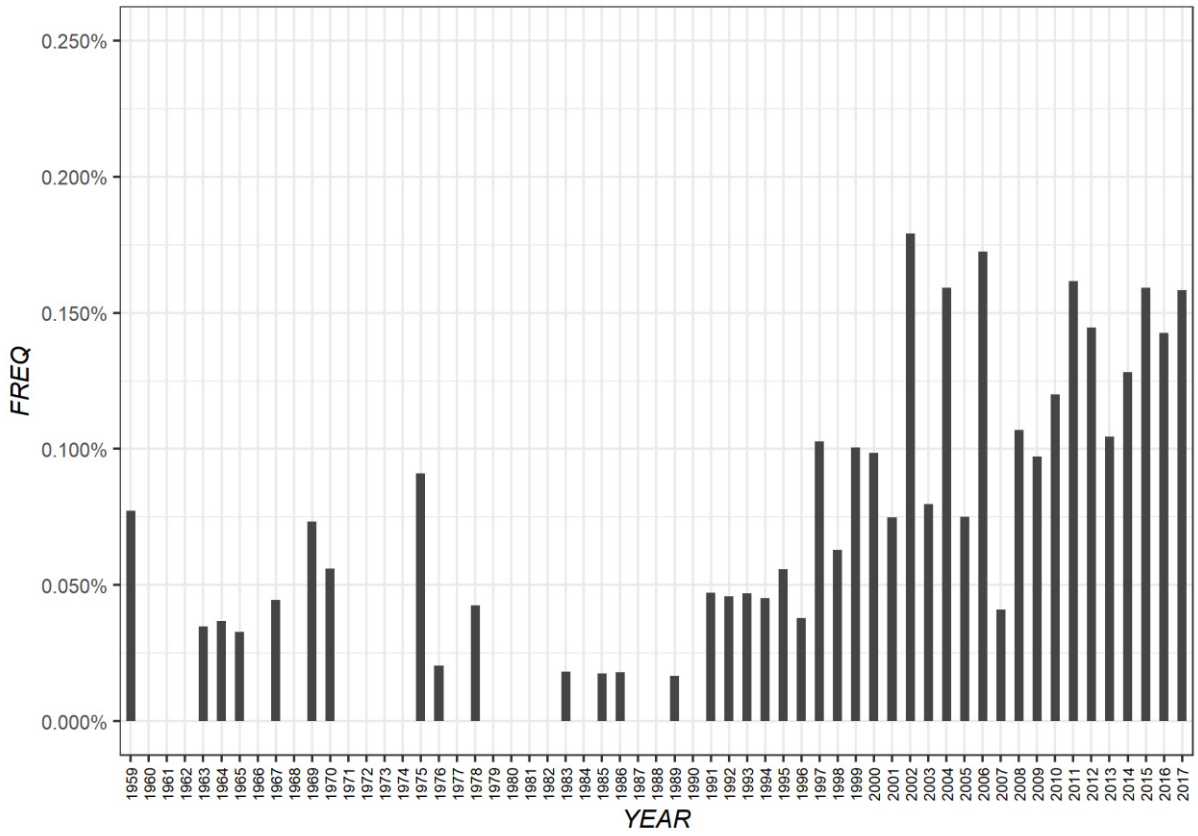
The third essay, finally, is a normative defense of economics as an interdisciplinary social science. It is the essay in which we develop our defense on *why* economics should pay more tribute to its fellow social sciences. This essay departs from the recognition, laid down in the second essay, that economics' levels of social science interdisciplinarity are not yet enough to be taken as satisfactory. The philosophy of science we use here to ground our considerations is the *coherentist theory of justification*, established by Laurence BonJour (1985). Through this approach, we intend to convince the reader that economics has much to gain, in epistemological terms, from a higher level of integration with the other social sciences.

2. ESSAY 1: THE ECONOMIC LITERATURE ON THE DISCIPLINE'S INTERDISCIPLINARITY WITH THE SOCIAL SCIENCES: A SURVEY

2.1. INTRODUCTION

Interdisciplinarity studies have recently gained status of a consolidated and independent area of research (HVIDTFELDT, 2018, p. 2). Representative works in this tradition are Berger et al (1972), Frodeman, Klein, and Mitcham (2010), Hvidtfeldt (2018), and Weingart and Stehr (2000). According to Hvidtfeldt (2018, p. 2), this independence of interdisciplinarity studies is a product of the growing academic interest in the subject. Within the economics profession, this was not different. A search for the radical "*interdisciplinar*" and its variations in economics papers shows that these discussions actually became systematically—though inconsistently—more relevant to the profession. Graph 1 summarizes the information assembled from the Web of Science Core Collection Database in relation to the total number of articles published in economics.

Graph 1 – Recurrence of the words "interdisciplinary" or "interdisciplinarity" per year, in economics articles, in relation to the total number of published articles



Source: Elaborated by the author based on the Scopus database. Date of access: December 11th, 2017.

This graph does not isolate the use of this radical in relation to social sciences, though. In fact, it makes no classification whatsoever about its use. It simply represents the recurrence of the words related to interdisciplinarity, which appeared for the first time in the economics articles indexed by Web of Science in 1959. Moreover, it should not be inferred from graph 1 that economics has become more interdisciplinary. What the graph portrays is an inconsistent growth, especially from 1991 onwards, in *discussions about interdisciplinarity*—and this might easily represent *criticisms* to the idea of economics as an interdisciplinary science.

Meanwhile, the actual position held by economists regarding interdisciplinarity may be more straightforwardly inferred from Fourcade, Ollion, and Algan (2015, p. 95). The authors organize a table with information collected in an opinion survey about the views of social scientists from different disciplines regarding the epistemic value of interdisciplinarity. The table contains the answers of professors of economics, sociology, political science, psychology, finance, and history. The scholars were confronted with the following assertion: "*In general, interdisciplinary knowledge is better than knowledge obtained by a single discipline*," and asked to agree or disagree with it. Economics professors were those with the lower percentage of agreement (42.1%)—and the only discipline whose professors disagreeing with the statement were the majority.

Nevertheless, there is a considerable literature relating economics and other disciplines. Our concern here is economics' interdisciplinarity with the social sciences. Therefore, this essay surveys the economic literature on the discipline's interdisciplinarity with its fellow social sciences. It is intended to summarize and present the main discussions relating economics and the social sciences carried on throughout the years.

In order to offer a comprehensive presentation of the works whose *leitmotif* is the treatment of economics as an interdisciplinary social science, we performed a research on the *Scopus* database.[1] The criteria of our search were:

(I) Within *Document titles*, AND/OR *Abstracts*, AND/OR *Keywords*;

(II) OF *articles*, OR *books*, OR *book chapters*, OR *conference papers*, OR *notes*, OR *editorials*, OR *articles in press*;

(III) PUBLISHED IN the subject area *Economics, Econometrics and Finance*;

(IV) EITHER the term "*interdisciplinary*" AND/OR the term "*interdisciplinarity*";

[1] This search took place on April 5th, 2019.

(V) AND "*Anthropology*", OR "*Political Science*", OR "*Psychology*", OR "*Sociology*", OR "*Social Science*";

(VI) OR the expression *"Economics imperialism*";[2]

Therefore, we looked for works that combined (I), (II), (III), (IV) and (V) or that combined (I), (II), (III) and (VI). Our research returned 527 entries, which we managed to narrow down (through the subjective classification of their abstracts) to 236 references. These integrate our survey and were assigned to one of the following categories, established *ex post* from the main lines of research identified in our group of 236 entries: (a) case studies; (b) economics imperialism; (c) history of interdisciplinarity; (d) interdisciplinary thinkers; (e) miscellaneous (feminist approaches, law & economics, new institutionalist works, and psychology & economics); (f) normative works; (g) organizations promoting interdisciplinarity, and; (h) positive or theoretical works.

Following this introduction, therefore, section 2.2 relates the works surveyed, briefly presenting their nature. Section 2.3 presents some insightful numbers regarding our 236 works, such as distribution across time and space, the journals in which they appear, and else. Section 2.4, finally, gathers some concluding remarks.

2.2. THE LITERATURE ON ECONOMICS' INTERDISCIPLINARITY WITH THE SOCIAL SCIENCES

This section aims at briefly presenting the discussions held within the aforementioned categories. Our attempt here is to sequence these categories—and the works within each one of them—in a way that does not harm the flow of the text. Accordingly, there is no criteria of prominence embedded in this presentation. In this sense, Kuiper and Barker (2005), the last work listed, by no means is less important than Milonakis and Fine (2008), the first one we present.

2.2.1. Histories of interdisciplinarity: qualitative and quantitative

[2] More specifically, the filter was: *SUBJAREA (econ) AND (TITLE-ABS-KEY ("interdisciplinar*") AND TITLE-ABS-KEY ("anthropolog*" OR "political science" OR "psycholog*" OR "sociolog*" OR "social science")) OR (TITLE-ABS-KEY ("economics imperialism")) AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "bk") OR LIMIT-TO (DOCTYPE, "ch") OR LIMIT-TO (DOCTYPE, "cp") OR LIMIT-TO (DOCTYPE, "no") OR LIMIT-TO (DOCTYPE, "ed") OR LIMIT-TO (DOCTYPE, "ip"))*.

Milonakis and Fine (2008) is one of the three qualitative works on the *history of interdisciplinarity* category. In the book, the authors argue that economics was once a multidimensional and pluralistic science, pointing out that the reversion of this situation took place with the transformation of political economy into economics. This led to the separation of economic mainstream from the other social sciences and to the abandonment of social and historical concerns. Another work within this category is Backhouse and Fontaine (2018), which shows that there is a considerable history of the interaction between economists and other social scientists. The authors go back to the end of World War I to separate the history of this interaction into distinct periods, each of which had specific groups of economists as representatives of this intercommunication. Tittenbrun (2017), furthermore, evaluates the social sciences' appropriation of the concept of *capital* from the economic discipline. The author analyzes to what extent concepts such as social capital, human capital, and cultural capital remained faithful to the original conception of *capital*.

Adjacent to these historical remarks, we highlight the works that study the history of the interdisciplinary engagements of economics with the other social sciences from a quantitative perspective. Pieters and Baumgartner (2002) analyzes the communication flows, for the period 1995-1997, both (a) between economics journals, and (b) between economics journals and the other social sciences and business. They worked with forty-two economics journals and divided them into seven clusters, organized by citation proximity. In this study, economics portrays high levels of intradisciplinarity. Fourcade, Ollion, and Algan (2015) explores the relationship between economics and the other social sciences in different measures, such as insularity, hierarchy, network of affiliations, and social influence. The paper takes in consideration the period 2000-2009 and the analysis is made *vis-à-vis* sociology and political science. The conclusion is that economics is more insular than the other social sciences and that economics has more space in the neighboring disciplines than the contrary. Angrist et al (2019) evaluates the impacts of extramural—a term the authors used as a substitute to what is conventionally termed interdisciplinary—citations among the social sciences and many other fields of knowledge, ranging their analysis from 1970 to 2015. The study shows that economics is among the most insular social sciences, but that this situation has been slightly ameliorated in the past few years. Kornai (2008) confirms the author's own negative experiences regarding the interdisciplinarity of economics and demonstrates that economics, law, political science, and sociology have low levels of interdisciplinary citations to each other. Despite this, the paper identifies some historical positive examples in these interactions, such as the birth of interdisciplinary fields of knowledge whose reach transcends the boundaries of a single

discipline, as the theory of rational choice and game theory. Knox, Savage, and Harvey (2006), finally, an essay that is not quantitative *per se*, but which recommends the application of quantitative methods to the study of interdisciplinary interaction, highlights the research opportunities arising from the application of social network analysis as a method to the study of interdisciplinary cooperation.

2.2.2. Positive/theoretical interdisciplinarity accounts

This leads us to the studies that offer either a positive or a theoretical account of interdisciplinarity. These works either focus on current or past interdisciplinary ventures or evaluate interdisciplinary theories. Barry, Born, and Weszkalnys (2008) interrogates contemporary accounts of interdisciplinarity, through an empirical study of interdisciplinary fields. The authors stress that interdisciplinary relations often do not present themselves in terms of cooperation, but in terms of agonism and antagonism. From this, the paper derives the different logics of interdisciplinarity. Siegers (1992) constructs a theoretical framework that combines the most important aspects of economics and sociology. Comparing this framework with traditional economic modeling, it concludes that this framework enables more balanced analyses of legislation and regulation than the ones in fashion by the time the paper was written.

Nachane (2015) studies the question regarding the unity of sciences and its transformation from "unity in viewpoint" to "methodological unity" and how this ushered an era of formalism in the social sciences, and, more specifically, in economics. Within this formalism of economics, Rol (2008) enquires about abstraction and idealization within the discipline. In his reasoning, the author understands idealizational clauses as prohibitive of external judgments, rendering considerable issues for interdisciplinarity. As an alternative to the formalist perspective regnant in economics, Dow (2012) presents a pluralist and interdisciplinary approach to policy in the wake of the financial crisis. In a related topic, Chafim (2016), opposing pluralism and economics imperialism—to which we return later—as two distinct forms of interdisciplinarity, advances the argument that, unlike natural sciences, the social sciences actually have ontological roots that justify their independence from each other.

Also in relation to ontological roots, Beretta (2012) brings the limitations of both behavioral economics and neuroeconomics to the spotlight and discusses economic rationality from an interdisciplinary point of view. The paper also argues that rationality is a powerful tool to approach a realistic anthropology. This approach to rationality from an interdisciplinary perspective, however, was no novelty, as Hoyt (1965) had already discussed the process of

individual choice from the vantage point of economics, psychology, and anthropology, condemning the lack of communication between the disciplines.

Interdisciplinary approaches to rationality, relying on the behavioral economics apparatus can be found in Brzezicka and Wisniewski (2014), which discusses the relation between the *homo economicus* and behavioral economics, and Muradoglu and Harvey (2012), which applies behavioral economics to the field of finance, delineating its higher potential for accurate evaluations. On this subject matter, in addition, Truc (2018) investigates the relation between psychologists, mainstream economists and behavioral economists in order to determine whether or not has behavioral economics become mainstream. Neuroeconomics-related approaches, on the other hand, are present in Kuorikoski and Ylikoski (2010), which actually presents some criticism to neuroeconomics, arguing that the explanatory relevance this method may bring about is only relevant if it informs causal and explanatory accounts of human decision-making.

Tuyon and Ahmad (2018) adapts an approach psychoanalysts use to investigate human minds to develop an alternative theoretical framework for the study of investors' irrational behavior in finance theories. The validity of the framework is empirically supported by the data on a representative emerging stock market. Pixley (2012) uses not only economics and psychology, but also sociology, to offer an understanding of money that brings civilizing sentiments to the fore of the analysis. Its aim is to explain how agents interact in the uncontrollable and fragile world of finance. Gries and Müller (2017), alternatively, develops a conceptual apparatus based on economics, sociology, and psychology for explaining violent social conflicts, identifying crucial individual and social mechanisms. The process thus described in the paper combines rational economic thinking, social belongingness, and individual psychological dispositions.

As there are these approaches relating economics and psychology, and economics, psychology, and sociology, there are the ones that focus specifically on the relation between economics and sociology. Cavalieri (2016) studies the proximity between sociology and institutional economics in the United States academic stage at the turn of the twentieth-century. Ramella (2015) offers a sociological overview of theories and researches on economic innovation, presenting an integrated sociological approach to the study of this subject. Christoforou and Davis (2014) elaborates new perspectives on social capital departing from social values, power relationships, and social identity—bringing political science to the analysis as well. Braham and Steffen (2008) is another example of analysis relating economics,

sociology, and political science. The book focuses on three concepts that, together, form the heart of theories of democracy and social welfare: power, freedom, and voting.

Because of this interrelation between economics and sociology, Smelser and Swedberg (2010) published a handbook on economic sociology discussing the subject as an emerging field of research. The handbook serves as basic reference for researchers on various social disciplines. The same could be said about Swedberg (2009), which systematizes the principles of economic sociology and provides a survey of the field. Stern (1993), furthermore, identifies an intellectual gap between economics and sociology, which could be solved by the dawn of socio-economics. Beckmann and Padmanabhan (2009) is an example of work that combines the approaches to study a specific object: the management of natural resources.

Natural resources, the environment, and sustainability, in fact, constitute an important niche for the elaboration of both interdisciplinary theories and interdisciplinary historical appraisals. Shmelev and Shmeleva (2012) weighs in the current environmental thinking combining macroeconomics, psychology, and green national accounting. Erjavec and Lovec (2017) demonstrates that the concerns of the European Union's Common Agricultural Policy have shifted from market distortions to international trade and budgetary decision-making frameworks. Newton and Cantarello (2014) provides an introduction to the study of the green economy, in which the subject is not treated merely as a subset of economics. Birnbacher and Thorseth (2015), adopting a philosophical approach to the politics of sustainability, links political, psychological, ecological, and economic analyses to meet the challenges posed by climate change. Gibson, Ostrom, and Ahn (2000),[3] moreover, surveys the concept of scale employed in the social sciences in order to show how it relates to the human dimensions of global environmental change.

Another niche of interdisciplinarity in economics is the one represented by law-based studies. These studies are comprehensive as to include insights from legal theory, anthropology, economics, history, theology, and other areas. Beard (2006) offers an account of the genealogy of western capitalist development. Piga and Treumer (2013) explores public procurement and the relation between contracts awarded by the public sector to companies and the efficient achievement of public goals. Forte, Mudambi, and Navarra (2014) comprehends a handbook on public economics, oriented towards interdisciplinary approaches as well. Brousseau and Glachant (2013) theorizes about how markets are designed and shaped, offering a view of the market as social constructs.

[3] Elinor Ostrom is one of the 2009 Nobel laureates.

Beyond these, markets and economic development are also subjects about which interdisciplinary studies have been conducted. Helmsing and Vellema (2012) shows how trade is managed and asks theory-driven questions about the relation between value chains and locally-rooted development processes. Silvestrov, Zeldner, and Osipov (2015) evaluates economic dysfunction, aiming at the establishment of a system to overcome dysfunctions in economic development. Wallenborn (2018) explores the Jevons Paradox and its implications in the market of energy, taking into account rebound effects. Caloffi, Lazzeretti, and Sedita (2018) analyzes how the concept of cluster literature departed from economic and sociological-related issues to become management-oriented, with innovation and firm performance as leading issues.

The subjects of innovation and entrepreneurship are also recurrent in the interdisciplinary economics literature. Siegel (2018) provides extensive evidence on university technology transfer and innovation partnerships, and focuses on the public policy implications of the globalization of research and development. Pratt and Jeffcutt (2009) relates creativity, innovation, and the cultural economy to consider key issues and debates regarding knowledge relationships and transactions. Thomas and Chan (2013) investigates creativity in diverse fields, including the social sciences and other levels of society. Nooteboom (2003) presents how innovation and the globalization process have led to increased opportunities for international and inter-firm collaboration.

We can also identify interdisciplinary studies regarding culture, cultural exchange, and cultural theory in economics publications. Bertacchini et al. (2012), from the perspective of cultural economics, is a comprehensive tome on cultural economics, and explores the idea of how cultural commons can be applied in a wide range of areas. Wortham (1997) makes use of Derrida's conception of gift to evaluate the location and the deployment of economics within the intellectual and discursive nature of cultural analysis. Anthropology and ethnicity, and their straightforward relations to culture, were also topics considered. Ethnicity, ethnic strife, and its consequences, from the vantage point of several social disciplines, are the subject of Kanbur, Rajaram, and Varshney (2011). Hino (2012) investigates how ethnicity affects political discourse and economic output in Africa. The anthropological aspects of debt, taken to be a political and a social construct, are the focus of Hours and Ahmed (2015). In an adjacent topic, Bruni and Sena (2012) argues for the importance of charism in a series of topics, such as economics, sociology, theology, and politics. Koutsobinas (2014) relates cultural change to the system of status markets and their social effects, inaugurating the so-called political economy of status.

Cruz-Saco and Zelenev (2010) and Li and Tracer (2017) use interdisciplinarity to break free from the usual selfish conception of human action, relying on insights germane to the other social sciences in order to appreciate a selfless and solidary human nature. Cruz-Saco and Zelenev (2010) documents how intergenerational solidarity evolved as a response to major changes in the social fabric. Li and Tracer (2017) organizes cutting-edge ideas from several disciplines to present human behavior as truly altruistic and cooperative; equity and social justice are paramount factors in this analysis.

Alternatively, the literature also links social justice to health and common well-being. Ruger (2010) develops an interdisciplinary health capability paradigm to justify the direct moral importance of health for the good life. The good life, Rosa and Henning (2017) further argues, is not only possible, but highly desirable. Accordingly, Rosa and Henning (2017) is a book that brings together experts from different fields to discuss the political and social conditions for the good life in societies where material growth is no longer sufficient to improve the quality of people's lives.

Adjacent to the discussion of the good life, furthermore, topics related to destruction and war must also be mentioned as those preventing its accomplishment. Coyne and Mathers (2011) addresses manifold affairs related to wars: how they begin, how they are waged, what follows them, and which alternatives there are to avoid them. Vahabi (2004) relies on insights from several social disciplines to delineate the political economy of destructive power, highlighting the economic roles of violence both as a destructive and as a constructive force.

A handful of miscellaneous and isolated positive/theoretical interdisciplinary projects can be designated. Gazzola, Templin, and Wickström (2018), considering language policies to be determinant to decisions related to social and economic justice, offers new input to design better, more efficient, and fair language policies in order to manage linguistic diversity in different areas. Stafford and Tews (2009), aiming at the integration of economics, sociology, and psychology, develops a work-family fit model. Building upon the necessarily interdisciplinary field of the economics of religion, Finke and Bader (2012) treats the data related to this research area to offer some indexes. Ganssmann (2012) brings together researchers from several fields to understand the functioning of money as a social construction.

Consumer behavior, finally, drew the attention of Sibbel (2003), Sherry and Fischer (2008), Izberk-Bilgin (2010), Viganò et al. (2015), MacInnis and Folkes (2010), and Rasumovskaya et al. (2017). Sibbel (2003) offers an overview of consumer science, highlighting its holistic and all-encompassing nature. Sherry and Fischer (2008) presents a collection of empirical and theoretical explorations of the relationship developed between the

consumers, goods, and services, on the one hand, and, on the other, between consumers and the stakeholders that animate the markets. Izberk-Bilgin (2010) reviews the historical and discursive constructions of consumer resistance. Viganò et al. (2015) provides an interdisciplinary sketch of the so-called postmodern consumer of food products. At last, MacInnis and Folkes (2010) argues, from the standpoint of the sociology of science, that consumer behavior is neither an independent discipline nor an interdisciplinary one; in this sense, the article concludes, the field's distinguishing feature is its focus on the role of the consumer. This is, therefore, an example of work that denies interdisciplinarity. Alternatively, Rasumovskaya et al. (2017) suggests an approach to consumer theory that is necessarily interdisciplinary, evaluating how consumer behavior can influence the social change process.

2.2.3. Interdisciplinary case studies

We now move on to those studies whose leitmotif is the actual application of interdisciplinarity to concrete cases. We believe this is the most important category of our review (and it is actually the most representative one), because it comprises the practice of interdisciplinarity itself. Positive studies address the practice of interdisciplinarity, while normative ones recommend its practice, but those that effectively exercise interdisciplinarity are here classified within the *case studies* category.

We begin this presentation following the topic that closed the previous section: consumer theory and behavior. Birner et al. (2003), combining economic and sociological concepts, challenges the view held in Germany that the low demand for environment friendly products proves that consumers do not want these products. Brighetti, Lucarelli, and Marinelli (2014) tests the influence of emotions and psychological traits on the consumption behavior for insurances. Hulme (2014) explores the evolution of consumerism in China from both a socio-economic and a political and cultural angle.

Beyond Hulme (2014), a substantial number of the interdisciplinary case studies considered here is concerned with the study of the Chinese society by means of the social sciences. Sun and Guo (2013) relies mainly on economics and sociology to understand the rampant inequality brought about in China by the country's economic reforms. Similarly, Fu (2010) investigates how the market-friendly reforms relate to foreign direct investment within Chinese boundaries; the perspective adopted relies particularly on economics, law, and political science. Yang (2012) studies the rise of entrepreneurship in China amidst communist ideologies; the author's perspective relates to sociology, economics, and Asian studies.

The interdisciplinary Asian studies are not, however, restricted to China. Vandusen, Gauchan, and Smale (2007) empirically evaluates farmer management of rice in Nepal. Kumar and Murali (2009) depicts the relation between the growing economic dynamism and the evolving institutions in the Indian economy. Also regarding India, Nielsen and Oskarsson (2016) highlights new ways to study the country's contemporary industrialization and its challenges. Ahrens and Hoen (2012) investigates the challenges of institutional transition—especially after the disintegration of the Soviet Union—faced by central Asia, a markedly non-democratic region.

Post-communism studies regarding Russia and other countries have also been prolific in social science interdisciplinarity. Sapronov and Ivanov (2016) discusses the recent social polarization in Russia. Bochko (2016) discloses the new reality in Russia, which consists in the strengthening of the man-personality and in the increase of regional autonomy in relation to the federal center. McDermott (2010) offers a framework for analyzing how post-communist societies restructure the institutions of their economies, taking a closer look at communist Czechoslovakia. Šimelyte, Korsakiene, and Ščeulovs (2017) scrutinizes recent globalization and Americanization in Lithuania. Kyrchaniv (2015) employs an economic anthropology framework to understand the post-soviet landscapes of Ukraine and Russia regarding political regionalization. Efendic, Babic, and Rebmann (2017), similarly, evaluates migration, ethnic diversity, and economic performance in South-East Europe.

Beyond the post-communist societies, other middle-income countries have also been the target of interdisciplinary case studies. Saad-Filho and Yalman (2009) comprehensively scrutinizes a group of countries, such as Brazil, China, South Africa, and Turkey, with regard to their transition processes to neoliberalism. Bardy, Drew, and Kennedy (2012) examines whether or not foreign direct investments can promote social and economic development in emerging countries. Giuliani and Macchi (2014) joins this foreign direct investment in emerging countries with a discussion on its impact on human rights, germane to political science, business ethics, and international law. Bekaert and Harvey (2002) focuses on the interdisciplinary aspects of financial markets that make emerging nations attractive for investment. Zaoual (2007), counting with insights from both economics and anthropology, looks into the relation between development and territory, confronting the development of developing countries with southern/northern dichotomies. Issberner and Léna (2016) inspects Brazil's role in the global ecological crisis scenario, bringing to the fore how environmental policies are influenced by social, political, ethical, and economic factors. Benedikter and Siepmann (2015) explores the inception of institutional, political, and social innovation in Chile

as a means for continuing economic development. Furthermore, a work that studies an ethnic group within a developed country is Saad-Lessler and Richman (2014), which combines anthropological and economic insights to evaluate the way the collectivist cultural values of Mexican-Americans impact their behaviors concerning savings and plans for retirement.

Correlate analyses are those (I) that consider wholesale global development and globalization; (II) whose leitmotif is the contrast between developing and developed areas, and; (III) that examine developed regions. Mahutga (2014) bridges the interdisciplinary literature on global commodity chains, global value chains, and global production networks. Davis (2018) analyzes the impacts of the global trade system on development and the resistance to globalization. Mucelli and Spigarelli (2017) compares and looks for improvement opportunities in the European and in the Chinese healthcare systems. Nuroğlu, Bayrakmeydanoğlu, and Bayrakli (2015) makes an inquiry on the relations between Germany and Turkey from the vantage points of political science, sociology, and economics. Rodrigues (2009) reviews Europe's role in the complexities and challenges of the Lisbon agenda. Herzog (2015) creates a unique link between sociology and economics to study the roots and causes of the euro crisis. Whitmarsh and Köhler (2010), assesses environmental novelties in the automotive sector and how these novelties relate to behavioral changes in transport habits within the European Union. Bernitz et al. (2018) recollects the challenges, problems, and possibilities related to the social aspect of European integration. Wolnicki (2012), taking the American government as parameter, advocates that pragmatism is better than any ideological compass as guiding principle for government spending.

Embedded in these discussions, financial integration and crises were important niches of interdisciplinary research. Hermann (2015) highlights the potential of an interdisciplinary approach for understanding the manifold causes and consequences of the 2008 economic crisis. Likewise, Cassis and Wójcik (2018) gathers specialists in manifold disciplines to understand the repercussions of the 2008 financial crises on major financial centers and to forecast how these centers could be affected by Brexit. Farrar and Mayes (2013) revisits the concept of globalization in order to understand its relation with the 2008 crisis and the state. Hossein-Zadeh (2014) adopts an interdisciplinary standpoint to address the core dynamics of capitalism that fostered financial market irrational behavior and ensuing financial bubble. Greenglass et al. (2014) summarizes the perspectives of economics and psychologists from several countries on the effects of the crisis on their respective homelands. Furthermore, beyond the 2008 crisis, Pressman (1998) uses insights from empirical psychology to explain why financial frauds are so prevalent.

Cities, civilizations, and their origins have also made their way into the interdisciplinary debates. Kleer and Nawrot (2018) analyzes the challenges and opportunities the rise of megacities poses to society. May and Perry (2017) examines the relationship between urban development and knowledge in contemporary era. Guo (2017) explores the dynamic forces behind the development of civilizations, arguing that weakness, not strength—in an anti-Darwinian sense—forced societies to adapt and endure. Adjacent to this discussion of societal weakness and strength, Kimbrough and Shermeta (2019) is a special issue whose raison d'être is the encouragement of interdisciplinary work on conflict and war. Svizzero and Tisdell (2016) surveys theories of economic evolution of societies, drawing on economics and anthropology to focus especially on hunter-gatherer societies.

Additionally, as in the previous section, this one counts with miscellaneous works on manifold subjects. Kyrchaniv (2016) aims at understanding the systemic features, trends, and characteristics of economic regionalization in the context of local currencies. Montella (2015), relying on several social disciplines, clarifies the meaning of historical cultural value, which the author sees as commonly misunderstood in economics. Marzano, Carss, and Bell (2006) focuses on the interdisciplinary practices of the United Kingdom's Rural Economy and Land Use Programme. Long (1979) dissects the term technology from manifold perspectives in order to contrast it with economics' usual definition. Zagler (2010) offers an innovative interdisciplinary approach on the issue of international tax coordination.

We can also identify works concerned with the market labor, human resources, and household behavior. Horodnic et al. (2017) explains the persistence of informal work and entrepreneurship. Scida (1996) sketches a sociological approach to the study of labor migration. Dietz and Haurin (2003) reviews the literature on the economic and social consequences of homeownership. Vinokurov, Medved, and Mierin (2018), at the intersection of psychology, sociology, political science, and economics, presents the role of information in household decisions regarding consumption and savings. Kalil and Deleire (2004) organizes the insights of researchers on manifold disciplines to discuss investments in children cognitive development. Kaneklin (2009), relying on economics and psychology, investigates the challenges currently faced by organizations in managing people and knowledge. Schroedler (2017) depicts the value of language skills within the Irish economy. Arocena and Villanueva (2003), considering that an employment relationship is not merely an exchange of work for a wage, analyzes the several incentives at work on the market labor.

Finally, environmental issues may also be pointed out as a target of interdisciplinary ventures. Kumar and Kumar (2008), from a psychological perspective, offers a valuation of

ecosystem services. Neuteleers and Engelen (2015), bringing insights from different disciplines, evaluates whether or not people crowd out their positive attitudes towards environmental preservation when confronted with economic discourse. Turner et al. (1999), joint effort of a large group of scientists, makes a cost and benefit analysis regarding pollutants in the Baltic Sea. Muthoo (1970) focuses on the problem of planning renewable natural resource use to the benefit of socio-economic development. Vandermeulen and Vanhuylenbroeck (2008) appends several existing studies on agricultural development from various disciplines, joining them in a transdisciplinary approach. Urban and Nordensvärd (2013) comprehensively addresses, in carbon constrained world, the relation between climate change and international development. Maxwell (1986), at last, describes the participation of social scientists in agricultural research institutions and their propensity to conflict. This is the first of the studies we will highlight that relates interdisciplinarity with organizations responsible for promoting interactive and holistic knowledge creation in the social sciences.

2.2.4. Organizations promoting interdisciplinarity

Interdisciplinary case studies relate to those concerned with the investigation of organizations that promote actual interdisciplinarity. This is a particular sort of interdisciplinary case study. Maryudi, Nurrochmat, and Giessen (2018) details a conference held by the International Union of Forest Research Organizations whose aim was to be the global scientific hub for research in the social sciences related to forests. Bowles et al. (1999) reports a symposium held by the University of Missouri – Kansas City in order to promote socio-economics, global social theory, and interdisciplinary social science. Emmett (2010) investigates the creation, within the University of Chicago, of the Committee on Social Thought, an academic interdisciplinary unit in the social sciences and humanities. Wade (2010) describes a pioneer interdisciplinary course taught by an economist and a sociologist in relation to specific health topics. Mehdizadeh (1993) evaluates the contributions to the *American Journal of Economics and Sociology*,[4] which is an interdisciplinary journal in essence; the author concludes that, despite this interdisciplinary inclination, economists are the major contributors to the journal. Similarly, Kirchler and Hölzl (2006) investigates the interdisciplinarity of economic psychology as materialized in the *Journal of Economic Psychology*, performing a bibliometric exercise on the nature of the field. Bolshakov (2017)

[4] The *American Journal of Economics and Sociology*, as presented in section 2.3, is the most important economics journal in terms of social science interdisciplinarity.

inquires on the activity of the Mixed Methods Research and Study Group in Russia as the proponent of an interdisciplinary agenda for the social sciences. Staudinger and Bowen (2011) presents the interdisciplinary research undertaken on the Jacobs Center on Lifelong Learning and Institutional Development. Cartes (2011), finally, from his experience as director of the Institute for Energy Systems Economics and Sustainability, discusses the importance of social science research in areas of energy.

2.2.5. Interdisciplinary scholars

From Cartes' (2011) experience, we can proceed to the studies whose aim is to scrutiny the work of scholars directly concerned with interdisciplinarity. Forstater (2002) recalls Adolph Lowe's contributions and plea for constructive synthesis within the social sciences. Bögenhold (2014), discussing Schumpeter's methodological constructs, regards how he placed economics in relation to the other social sciences in his seminal *History of Economic Analysis*. Brown (2007), Brown and Fleischaker (2010), and Forman (2016), in the book series called *The Adam Smith Review*, explore the multidisciplinary character of Adam Smith's thought, providing a venue for scholars of both the social sciences and the humanities to discuss openly the ideas of the Scottish illuminist.

Christoforou and Lainé (2014), aiming at rethinking economics, bring to the fore of the interdisciplinary discussion within economics the name of one of the greatest sociologists ever: Pierre Bourdieu. The authors argue that Bourdieu also thought about economics, but his work found little attention within the profession. Accordingly, his insights on power, intuitive behavior, and social structures could substantially improve economists' analysis.

Dolfsma and Kesting (2013) revisits Kenneth Boulding's writings as the quintessential interdisciplinary scholar, who managed to expand the boundaries of economics without undermining the disciplinary expertise of the neighboring social sciences. Pearson (2010) praises Melville Herskovit as the pioneer in the field of economic anthropology, between 1926 and 1952. Reisman (2004) investigates Richard Titmuss as a major interdisciplinary social scientist, whose theory of altruism managed to exert a deep impact on political economy through the rise of welfare state theories.

Tilman and Fontana (1985) scrutinizes Thorstein Veblen's impact on Italy. According to the authors, the Italian scholar community perceived, at first, Veblen as a forerunner of Franklin Delano Roosevelt's New Deal; later, this perception evolved and Veblen was seen as a social scientist whose work marked a pioneer effort in interdisciplinary analysis. Almeida

(2016), additionally, complements Veblen's insights on consumer behavior with Tibor Scitovsky's interdisciplinary approach to psychological economics. Still on the subject of psychology and behavioral economics, Augier and March (2002) surveys the work of Nobel Prize laureate Herbert Simon and the relevance of the interdisciplinary research program he advanced at Carnegie Mellon University from the 1950s to the 1960s. Innocenti (2010) explores how Sidney Siegel, a psychologist, before the consolidation of behavioral economics by the hands of Daniel Kahneman and Amos Tversky, inaugurated the field of experimental economics, a fundamentally interdisciplinary area of research.

Ambrosino (2014) defends that the significance of Friedrich Hayek's economic and legal writings can only be understood through the holistic consideration of his interdisciplinary apparatus. Corsi (2007) presents Sylos Labini's perspective on economic methodology; for Labini, interdisciplinarity was a necessary condition for the formulation of effective policy responses to social issues. This is the reason why he drew upon history, political science, and sociology to build his economic ideas. Mowles (2017) revisits Ralph Stacey's interdisciplinary education and experience in the process of inaugurating complexity analyses in economics. May and Summerfield (2012) interviews Elinor Ostrom and highlights the importance of interdisciplinarity in the establishment of her systematic thinking. Comim (2012) recollects Martha Nussbaum's work as a philosopher whose work had an impact on economists, sociologists, anthropologists, psychologists, and social scientists as a whole.

Davis (2013) revisits Uskali Mäki's epistemic analysis of economics imperialism, relating it with the ideal of science unification and the constraints generated by scientific imperialism as a whole. Falgueras- Sorauren (2018), similarly, reconsiders Lionel Robbin's role in the evolution of economics imperialism, drawing attention to the imperialistic character of Robbins' theorization. Fine (2003), at last, criticizes Michel Callon's economic perspective addressed by a special issue of the *Economy and Society*; Callon's programme on the inexistence of capitalism, Fine argues, would be nothing more than an attempt to strength the virulent assault from economics imperialism to the other social sciences.

2.2.6. Economics imperialism

Economics imperialism, accordingly, is also a hotspot of interdisciplinary discussion on economics. The nature of the interdisciplinarity fostered by economics imperialism is not the holistic one that embraces insights from manifold social scientists; au contraire, it answers for

the colonization of the fellow social sciences by economics. Nevertheless, this sort of interdisciplinary exchange cannot be ignored in our review of the literature on the topic.

Fine (1999), addressing individual optimization as a means for understanding social institutions and structures, marks one of the first influent epistemological discussions on the subject of economics imperialism, a trendy research topic in the last two decades—Lutz (1993) had already assessed this conundrum, relating economics imperialism and social economics. Mäki (2002) establishes that economics imperialism is the project of privileging rational choice as an all-encompassing ground for social science investigations; the author assesses Philip Petit and Frank Jackson explanatory ecumenism and the way it illuminates the question of economics imperialism. Cedrini and Marchionatti (2017) defends that economics chose to follow the path of colonization instead of the path of gift exchange, which would have allowed the discipline to scrutinize complex social issues. Fine (2009) approaches the identity of economics and the economics of identity, criticizing mainstream economic methods for their neglect of modern identity discussions and the consequent relation with scientific imperialism.

In a special issue of the *Journal of Economic Methodology*, Dekker and Teule (2012) delves into the analysis of the so-called "economics-made-fun" genre—whose greatest example is freakonomics—and raises questions on the impact it has on both the identity of economists and the domain of economics. The primary perception here is that this genre would impregnate offshore analyses with economic reasoning. In the same special issue, Mäki (2012), labeling this genre "new kiosk economics of everything," argues that, in a special and limited sense, this popularization of simple economic concepts qualifies as scientific imperialism. Vromen (2009), furthermore, on this same subject, examines the fairness of designating the economics-made-fun genre as a sort of economics imperialism.

Bögenhold (2018) explores recent advances in the social sciences, concluding that economics imperialism is increasingly colonizing neighboring disciplines such as history, psychology, and sociology. Fine (2002, 2004) inquire if this increasing colonizing process would represent a scientific revolution in the Kuhnian sense, drawing attention to its most dangerous features. Mäki and Marchionni (2011) investigates the relation between economic geography and geographical economics, conjecturing whether or not the latter would be colonizing the former.

Discussing Fine's and Thompson's views on economic imperialism, Nielsen and Morgan (2005) argues that mainstream economics actually has a proclivity towards expansion into economics' fellow social sciences. King (2012) poses sixteen questions to Fine and Milonakis based on their book on economics imperialism, *From Economics Imperialism to*

Freakonomics: the Shifting Boundaries between Economics and Other Social Sciences, published in 2009. Similarly, McNally (2012) also discusses the book, making the case that it lacks the explicit development of value analysis from the standpoint of dialectical social theory. Fine and Milonakis' (2009) book focuses on positive and normative conundrums related to the appropriation of the subject matter of other disciplines by economics, pondering whether or not economics has always presented this imperial pattern and if this should be so. Fine and Milonakis (2012) responds these considerations.

Davis (2016) treats Lazear's 2000 defense of economics imperialism, arguing that the Chicago school economist actually breeds an anti-interdisciplinary implicit agenda. Nik-Khah and Van Horn (2012) aims at understanding the historical roots of economics imperialism by analyzing the barycenter of this phenomenon, the University of Chicago. Marchionatti and Cedrini (2016) criticizes this imperialist position of economics and recommends a more democratic cooperation between the social sciences.

2.2.7. Normative defenses of interdisciplinarity

As such, there are also those works whose aim is the normative defense of economics as an interdisciplinary social science, either epistemologically defending its validity[5] or proposing particular interdisciplinary approaches.

Mixing normative recommendations with positive remarks, we have Rothschild (1989), Pietrykowski (2009), and Sotirov, Sallnäs, and Eriksson (2017). Rothschild (1989) traces a dichotomy between the pure science of economics and the interdisciplinary ventures of a so-called political economy, arguing for the complementarity between these two approaches and for theoretical and empirical openness. Pietrykowski (2009) proposes an interdisciplinary approach to consumption behavior, integrating economics, sociology, geography, and history. Sotirov, Sallnäs, and Eriksson (2017), drawing on economics, sociology, and psychology, develops an interdisciplinary agent-based approach to understand the endowment of forest ecosystem goods and services.

Sugiura (1999) stipulates that interdisciplinary studies of the social sciences are necessary for institutional economics. Dietz, Michie, and Oughton (2011) defends that the mainstream economic approach to environmental problems could be greatly improved by the adoption of reasoning from manifold social disciplines. Magatti (2017), given the neoliberal

[5] One of the essays in this dissertation has the same aim.

failure depicted in the 2008 crisis, offers an interdisciplinary alternative for reforming and redesigning capitalism and consumption societies, both structurally and culturally. Yang and Lester (1995) recommends the incorporation of an interdisciplinary area of inquiry to the domain of economics: the impact of economic variables on non-economic behavior.

Rol (2012), evaluating ceteris paribus clauses, recommends interdisciplinarity in concept choice for the appropriate design of policy interventions based on abstract laws. Landauer (1966), even though recognizing specialization is inevitable, defends that understanding about the social reality can only be achieved through the adoption of a perspective that congregates all the social sciences. Downward and Mearman (2007) presents mixed-methods triangulation as a tool to provide the unification of economics and social thought.

Appignanesi (2017), within the discussion of general systems theory, advocates the integration of concepts germane to economics and sociology as a means to reformulate sociological paradigms. Bondrea et al. (2015) suggests interdisciplinarity, alongside the study of complex systems and evolutionary economics, as a means to overcome the domination of neoclassical economics, repeatedly proved wrong by economics crises. Klintman (2016), similarly, proposes the integration of economics, the social sciences, and evolutionary science, providing a framework for better analyzing human interactions across the human sciences. Winthrop (1975) regards interdisciplinarity as a means for designing a cohesive research area on social policy and social planning. Goorha (2009) suggests the Knowledge Economy Social Network as a means to enable policy focused in a knowledge economy. Haldane and Turrell (2018), in addition, supports the complementarity between agent-based macroeconomic approaches and interdisciplinarity.

Caillé (2018) defends that a general social science is necessary, giving up the utilitarian inclination of economics. Zafirovski (2000a), furthermore, contests the view that the integration of the social sciences should depart from rational choice theory, accusing it of being inappropriate to explain social phenomena even more than it is unfit to represent exclusively economic ones. Pluta (2010), alternatively, argues that a promising venue for this integration would be the Veblen-Myrdal notion of Circular and Cumulative Causation. Ripsas (1998) claiming the inexistence of a widely accepted theory of entrepreneurship in economics, proposes the establishment of such theory based on economic decision theory, sociology, and psychology. Gartland (2005) calls upon economists to be mindful of the literature on the sub-optimality of path dependence, which economics itself first made popular.

Szostak (2009), aiming at the problem of poverty, synthesizes insights from several social disciplines in order to understand more fully the process of economic growth. The author endorses this to be the only way to actually both grasp the mechanisms behind economic growth and improve the chances of poverty reduction. Staiano (2016) condemns the view of inequality as a driving force of growth and proposes an interdisciplinary approach to the theme combining economics, sociology, political science, and law. Jackson (2002), furthermore, campaigns for the end of the domination of economics on gender theories. Such theories, the author argues, could benefit from interdisciplinarity and from the incorporation of sociological, political, and anthropological arguments.

Coyne (2011) maintains a rational choice analysis of rituals, aiming both at the definition of rituals as important for economic and social outcomes and at showing how economics can be harmonized with concepts and ideas from the neighboring social sciences. Harriss (2002) advocates that there is no contradiction between the rigor of economics and "softness" of the social sciences, such that mainstream economics would be better equipped if confronted with historical and sociological inputs. Silva (2015), similarly, argues that mainstream economics, whose credibility was severely undermined by the 2008 economic crises, should be overcome through a paradigm shift drawing upon economics, political science, and international relations. Jan Tinbergen (1981), first Nobel laureate in economics, in 1969, advances the idea that the concept of welfare, even though central to economics, cannot be thoroughly grasped without interdisciplinary research.

The discussions on welfare bring about the issue of sustainability. Enders and Remig (2014) proposes a collection of interdisciplinary theories on the nature of sustainable development. Ittner and Ohl (2012) proposes a link between economics and psychology to deal with the coordination tensions between sovereign states and post-Kyoto environmental policies. Chen and Xie (2015) encourages the inclusion of other social disciplines in the Chinese discussions regarding climate change through institutional incentives and educational structures. In addition to Chen and Xie (2015), Saleh (2017) is another normative work focusing on a specific country/region, favoring the development of a new economic and social history of the Middle East and North Africa.

2.2.8. New institutionalism, law, psychology, and feminism

The final subsection in the presentation of the works relating economics and interdisciplinarity comprises a pool of topics. These works are sufficiently singular to be detached from the previous categories, but their number is rather limited.

Bachev (2009; 2013; 2016) tie new institutionalist theories with interdisciplinarity, offering novel new institutionalism-based frameworks for handling sustainability, agriculture, and the environment. These works treat new institutionalism as an inherently interdisciplinary theoretical body, which combines economics, political science, sociology, behavioral sciences, and law. Bachev (2009) proposes an innovative new institutionalist framework for analyzing the mechanisms of governance of sustainable development; Bachev (2013) offers a modern new institutionalist apparatus for addressing environmental management and strategies in agriculture; Bachev (2016) suggests a practical frame of reference for assessing the governance of agrarian sustainability. Kirchner (2007), alternatively, searches for integration opportunities between new institutionalism and public-choice theory, the interdisciplinary field that represents the application of economics to political science.

In between new institutionalism, sociology, and law, Zafirovski (2000b) calls upon the paradigmatic differences between new institutionalism and economic sociology. The author's argument is that these differences could be reconciled through an interdisciplinary perspective bringing together new institutionalism, sociology, and law.

Williamson (2015)—written by 2009 Nobel laureate Oliver Williamson—presents the transaction cost economics project as a way towards interdisciplinary social science. Coutinho (2017) explores the legal structure beneath different institutionalist schools, which the author also takes as eminently transversal and interdisciplinary. Backhaus (1995) comments on the idiosyncrasies of law and economics and their complementarity to produce an interdisciplinary project to study society. Paha (2016), alternatively, investigates how economists, lawyers, and psychologists can work together to improve the mechanisms of law compliance.

Moeller (2011) criticizes American-style capitalism and highlights the recent turn of economics to psychology as an indicative of reform in the discipline. Hosseini (2003) discusses the rise of behavioral economics, a field of inquiry whose roots are essentially interdisciplinary, tracing it back especially to Herbert Simon and George Katona, in the 1950s and 1960s. Fetchenhauer et al. (2012) touches on the increased cooperation between economists and psychologists throughout recent decades. The authors summarize the disciplines' ethical compasses, volition to influence reality, and the opportunities for more fruitful cooperation between them. Ur Rehman (2018) presents an overview of behavioral economics, from its roots on cognitive science to the interdisciplinary flavor it brings to economics.

Festré and Garrouste (2015), analyzing motivation crowding out, surveys the literatures on the topic both from economics and from psychology. The authors sketch an interdisciplinary approach likely to favor an effective cooperation between economics and psychology on the matter. Reynaud (1981) traces the importance of psychology to the use of the concepts of mental level and grasp of consciousness within economics. Daskalakis (2015) intertwines the discussion of environmental policies with behavioral issues, scrutinizing the sorts of concrete inputs behavioral economics might provide for the establishment of alternative environmental policy tools. Kennedy, Cohen, and Krogman (2015), moreover, researches the practice of sustainability and the understanding of contemporary consumption routines, challenging the usual approaches to social change based on social psychology and behavioral economics.

Finally, Pearse and Connell (2016) and Kuiper and Barker (2005) close our survey with interdisciplinary feminist studies. Pearse and Connell (2016) investigates the feminist economics' appropriation of the concept of gender norms, germane to sociology and other social sciences. The authors argue that norms are not loose ends in a vacuum, generally taking place within social contexts and institutions, in a way that the comprehension of these norms might indicate new spaces for activism and new possibilities for feminist economics as a research field. Kuiper and Barker (2005) offers a range of responses from feminist economics and other social sciences to a 2001 World Bank report on gender and development. The anthology analyzes gender, economic growth, and development, providing insights into future directions for feminist economics research.

2.3. ECONOMICS' INTERDISCIPLINARY LITERATURE IN NUMBERS

This section is not intended to be extensive. It aims at briefly presenting some key numbers regarding the literature just surveyed in section 2.2. More specifically, it intends to present the evolution of these works through time, the representativeness of each identified category, and the main publication vehicles.

The first point is that the absolute number of articles touching on any of the aforementioned interdisciplinary categories rose significantly through time. Out of our 236 articles, the oldest one is Hoyt (1965). From 1965 to the end of the century, only 24 studies were surveyed, nearly 10% of the total. If we extend this selection to 2008, this number rises to 67, which amounts to 28.39% of the 236 works in our survey.

The attention towards interdisciplinary disquisitions only took an effective turn in the last decade. 71.61% of the interdisciplinary research our survey contemplates is concentrated

on the last decade, from 2009 to 2019. This might indicate both a rise in the attention economists give to other social sciences and the growing disbelief in traditional economic reasoning, especially after the 2008 crisis—and, as a matter of fact, we saw that many of the works in our survey use the 2008 crisis and the ensuing mainstream discredit to justify the need for interdisciplinary research in economics.

Curiously, Hoyt (1965), published in the *Quarterly Journal of Economics*, is the only work surveyed published by a journal that integrates Conroy et al.'s (1995) group of Blue Ribbon journals.[6] This might suggest that the most prestigious journals in the discipline do not embrace interdisciplinary discussions. As such, it is important to remark the journals that actually embrace interdisciplinarity. This is especially important if we take into consideration the fact that 61.2% of the studies surveyed were published in academic journals (144 out of 236).

These 144 journals are scattered across 80 different journals, out of which 51 appear with one single work. Given this spread, we rank here the top 9 journals in our sample. The sum of the works we surveyed for each of these journals amounts to 33.33% of the overall. These journals, with the respective number of interdisciplinary works surveyed, are: *American Journal of Economics and Sociology* (7), *Economy and Society* (7), *Journal of Economic Methodology* (6), *Ecological Economics* (5), *Journal of Economic Issues* (5), *Journal of Economic Psychology* (5), *Journal of Socio-Economics* (5), *Cambridge Journal of Economics* (4), and *World Development* (4). Accordingly, within our sample, these journals might be taken to be those that most approximate economics to the social sciences.

Unlike journal articles, the books and book chapters considered here find an extremely concentrated structure, with a small number of publishing houses counting with the greater number of interdisciplinary publications. The 92 interdisciplinary studies published in books are spread across only 15 publishers, whereas 6 out of these 15 count with one single work. *Routledge* alone is responsible for 44.57% of all interdisciplinary books surveyed here. If we add *Springer*, *Edward Elgar*, and *Palgrave Macmillan* to *Routledge*, extending our considerations to the top 4 publishers in terms of economics' social science interdisciplinarity, we cover 77.17% of all the interdisciplinary discussions published in books.

Finally, it is interesting to notice that, journal articles are more representative than books and book chapters to all but one categories we identified in our survey. The exception is

[6] The other journals on Conroy et al.'s list are: *American Economic Review*, *Econometrica*, *International Economic Review*, *Journal of Economic Theory*, *Journal of Political Economy*, *Review of Economic Studies*, and *Review of Economics and Statistics*.

interdisciplinary case studies. This might indicate either that interdisciplinary case studies do not have much space in the pages of academic journals or that the nature of the works in this category is so specialized that it simply makes more sense to organize the related subjects in books. This becomes even more relevant when we take into consideration that interdisciplinary case studies is the most representative category in our study, with 64 works, followed by positive/theoretical interdisciplinarity accounts (63), normative defenses of interdisciplinarity (32), economics imperialism (21), and interdisciplinary scholars (20), miscellaneous (19), organizations promoting interdisciplinarity (9), and history of interdisciplinarity (8).

2.4. CONCLUDING REMARKS

This essay intended to present a survey of the economics literature on interdisciplinarity. In order to do that, we primarily filtered the works to be surveyed through the Scopus database. Afterwards, we used the abstracts of these machine-chosen studies to narrow down our sample of works to 236 research papers.

Our survey shows that the discipline presents a wide scope of topics discussed in an interdisciplinary fashion, ranging from interdisciplinary case studies to normative recommendations for the interdisciplinary practice of economics. These studies are spread across a great number of journals—among which we do not find the most prestigious economics journals—and among a narrow number of book publishers.

From this survey, we believe a series of future research opportunities surface. One is the study of particular economics journals in order to understand whether those journals publish or do not publish interdisciplinary researches in economics—and, more importantly, why these journals hold such editorial attitude. Within this, the analysis of different editorial perspectives, resulting in different editorial guidelines, may be shown to be paramount. Furthermore, a study on the market of book publications in economics might prove itself elucidating. The highly concentrated number of interdisciplinary book publishing in economics we found could benefit a great deal from an investigation of the overall market structure.

3. ESSAY 2: PATTERNS OF INTERDISCIPLINARY CITATIONS AND ASYMMETRY BETWEEN ECONOMICS AND THE NEIGHBORING SOCIAL SCIENCES FROM 1959 TO 2018

3.1. INTRODUCTION

Almost a decade ago, commenting about the history of economics and the history of the social sciences, Backhouse and Fontaine (2010, p. 3) stated that: "[w]hatever the period being considered, references to the relationships between economics and other social sciences are almost universally incidental in general histories of economics." Even within the specialized publications in the field of the history of economics, the literature dealing with the history of economics and the other social sciences is scarce. To illustrate this scarcity, the authors list the few papers they found on the subject—published between 2000 and 2010 (BACKHOUSE & FONTAINE, 2010, p. 3-6). Listing papers published since 2010, we think we could add only a few more on the subject, such as Rol (2012), Engerman (2015), Fontaine (2015), Cavalieri (2017), and Bögenhold (2018). Such scarcity of works on the subject indicates that the landscape in the history of economics is still one of relative neglect to the relationship between economics and the other social sciences. In an attempt to contribute to this literature, this essay focuses on the evolution of the interdisciplinarity between economics and the social sciences.

The research presented here is a descriptive quantitative analysis of the patterns of interaction among economics and the other social sciences since 1959.[7] Recently, a few studies quantitatively analyzed the interdisciplinary relations among the social sciences.[8] In these accounts, knowledge exchange appears as asymmetric and economics is taken to be more insular than its neighboring disciplines. For example, Fourcade, Ollion, and Algan (2015, p. 94), evaluating the insularity—understood as the absence of interdisciplinarity—of economics for the 2000s, identify economics as the least interdisciplinary discipline in relation to other social sciences. Notwithstanding, there are contemporary discussions on the topic indicating that economics has become more mindful of and tolerant with the other social sciences in the recent years; therefore, increasing the interdisciplinary interactions (BÖGENHOLD, 2018, p.

[7] Quantitative approaches have not yet become routine among historians and methodologists of economics. However, Edwards, Giraud, and Schinckus (2018, p. 283-284) identify an ongoing *methodological moment* on behalf of quantitative analyses in the history of economics.

[8] There is a vast literature on the differences between inter-, trans-, multi-, and cross-disciplinarity. We do not intend to discuss taxonomies. For a more comprehensive discussion on the particularities of each, see Piaget (1972) and Klein (2010). In the remainder of this essay, interdisciplinarity will be adopted to represent knowledge flow among separate disciplines.

1126; FONTAINE, 2015, p. 3; MÄKI, 2017). These discussions find support in a very recent research by Angrist et al.'s (2017, p. 2, 23-24), which presents economics with a growing tendency towards interdisciplinarity interaction with other social sciences.

Hence, the specific objective of this essay is to extend the empirical literature on the interdisciplinarity of economics in relation to its fellow social sciences. More specifically, this essay aims at performing a citation analysis in order to understand both whether or not economics has actually opened more space for the other social sciences and the subtleties of this process. We want to understand how the patterns of interdisciplinary citations between economics and the other social sciences evolved through time. However, since our time span is relatively large—encompassing the years between 1959 and 2018—we do not deal with particular events within the history of contemporary economics. We present general trends and general remarks about them.

Our study is close to the one performed by Angrist et al. (2017). We offer, however, a more comprehensive and focused discussion of the knowledge exchange between economics and the other social sciences. Our research is more comprehensive because it offers information on a wider and deeper range of relations, and more concentrated insofar as the discussion here is focused solely on the relations between economics and the other social sciences. We also developed an asymmetry measure that may allow both a more thorough perception about the relative relevance of economics before each social science and an evaluation of changes in the interdisciplinary structure of the social sciences in terms of reciprocal ties. Furthermore, the accomplishment of this objective may also serve the purpose of bringing quantitative remarks on the interdisciplinarity between economics and the neighboring social disciplines to the attention of the history of economics profession. None of the studies whose aim is this treatment were published in journals specialized in the area. Backhouse and Fontaine (2010, p. 6) defend that we should perhaps consider history of economics as history of social science. If this is the case, it may perhaps also be time for the historian of economic thought to complement his understanding of economics as a social science with maps of the historical relations between the social disciplines from a quantitative vantage point.

This essay is organized in four sections beyond this introduction. Section 3.2 details the hitherto existing empirical studies on the interdisciplinarity among the social sciences, explains our empirical strategy, and introduces the *Coefficient of Interdisciplinary Asymmetry*. Section 3.3 presents our results. Section 3.4 discusses the results presented in section 3.3. Closing, we present some final comments.

3.2. METHODOLOGY: CITATION ANALYSIS, EMPIRICAL STRATEGY, AND THE COEFFICIENT OF INTERDISCIPLINARY ASYMMETRY

This section counts with three subsections. The first subsection explains in what consists citation analysis and describes the four papers that, to our knowledge, measure social science interdisciplinarity. These papers are Rigney and Barnes (1980), Pieters and Baumgartner (2002), Fourcade, Ollion, and Algan (2015), and Angrist et al. (2017). The second subsection presents our empirical strategy. This presentation encompasses data, time span, and methodology. Finally, the third subsection lays out the estimation of the *Coefficient of Interdisciplinary Asymmetry*.

3.2.1. Citation analysis

A reference to an academic manuscript indicates that the referenced work is a relevant piece of knowledge worth bringing to the attention of the academic community. Citation analysis, accordingly, is a quantitative technique that answers for a bibliometric effort to understand how communication flows within a given scholarly network. Its aim is to describe the structure of the flow of ideas and understand the position journals, disciplines, and scholars occupy within the network (EDWARDS, GIRAUD & SCHINCKUS, 2018, p. 287; JOVANOVIC, 2018, p. 302; MOODY & LIGHT, 2006, p. 69-70; PIETERS & BAUMGARTNER, 2002, p. 483-484). In this sense, we may understand the social sciences as a specific social network of scholars, journals and academic departments, among which we are interested in the *journal* citation network. The disciplines commonly regarded as constituents of the social sciences are anthropology, economics, political science, psychology, and sociology (ABBOTT, 2001, p. 123; ANGRIST et al., 2017, p. 2; PIETERS & BAUMGARTNER, 2002, p. 485; RIGNEY & BARNES, 1980, p. 114-115). Studies that aim at understanding the structure of interdisciplinary journal citations within this network are scarce, however. To our knowledge, only four works on the subject have been published thus far—two in the last four years.

Rigney and Barnes's (1980) study consists of a comprehensive citation analysis to examine the interdisciplinary citations both (a) within the social sciences network, and (b) between each individual social science and the entirety of the academic disciplines. The authors

randomly sampled five percent of the citations from the flagship journal[9] of each social discipline and evaluated their publication sources. They also divided their time span in two comparable periods: 1936-1959 and 1960-1975. Their conclusion regarding economics is that, along psychology, the discipline had the lowest rates of interdisciplinary borrowing, the highest levels of intradisciplinary citations—citations to journals from within the discipline—, and did not receive many citations from its fellow social sciences as well.

Pieters and Baumgartner (2002) analyzed the communication flows, for the period 1995-1997, both (a) between economics journals, and (b) between economics journals and the other social sciences and business. They worked with forty two economics journals and divided them into seven clusters, organized by citation proximity. Economics once again portrayed high levels of intradisciplinarity, with a so-called asymmetric pattern of citation exchange between itself and the other social sciences.

Fourcade, Ollion, and Algan (2015) explored the relationship between economics and the other social sciences in different measures, among which we highlight insularity. The authors took in consideration the period 2000-2009 and the analysis was made *vis-à-vis* sociology and political science. The citing source adopted, as in Rigney and Barnes (1980), was the flagship journal for each discipline and the reference sources were those in the 2000-2009 top 25 journals for each discipline. Their conclusion was that economics is more insular than the other social sciences and that economics has more space in the neighboring disciplines than the contrary.

Angrist et al. (2017), finally, evaluate the impacts of extramural—a term the authors used as a substitute to what is conventionally termed interdisciplinary—citations among the social sciences and many other fields of knowledge, ranging their analysis from 1970 to 2015. Their analysis is a more comprehensive study in terms of fields. The authors show that economics is among the most insular social sciences, but that this situation was ameliorated in the past few years. Their unit of analysis is also a flagship journal—which they call trunk journals—for each science.

As such, then, the hitherto existing studies commonly regard economics as a discipline that relatively neglects its sister social sciences. To this extent, Angrist et al. (2017) differs from the other works insofar as it places the interdisciplinarity of economics in a state of progressive improvement. The most comprehensive discussion of Angrist et al.'s (2017) paper, however, regards the fields of economics that have become more important outside the discipline, not the

[9] The flagship journals are detailed below. They represent the core journal of the main American learned societies for each discipline.

general phenomena *per se*. Finally, this literature—once again with the exception of Angrist et al. (2017), which does not make any reference to asymmetry patterns—employs the concept of asymmetry rather loosely, which, as we will see, may jeopardize an accurate comprehension of the asymmetry patterns.

3.2.2. Empirical strategy and methodology

Our empirical strategy is, to some extent, a hybrid effort. It combines features of Angrist et al. (2017), Fourcade, Ollion, and Algan (2015), Pieters and Baumgartner (2002), and Rigney and Barnes (1980), with some new elements. It is, above all, a historical evaluation of economics' recent past. The bibliographic methods employed here solely serve the purpose of telling the history of developments circumscribed to our time span.

Following Angrist et al. (2017), Fourcade, Ollion, and Algan (2015), and Rigney and Barnes (1980), we will concentrate our analysis on one publication per discipline. This publication is the flagship journal of the main American learned society for each social science. We find in the literature four reasons to see this selection of journals as sufficient for our analysis. First, we take the flagship journal of the main American learned society for each discipline to fairly represent the central currents of research in their respective fields (RIGNEY & BARNES, 1980, p. 115). Second, knowledge production is a socially and institutionally embedded act, and the learned societies play a crucial role in this process, creating stimuli and development conditions, sponsoring research agendas, and coordinating research activities (ALMEIDA, ANGELI & PONTES, 2017, p. 81; COATS, 1985, p. 1725). Third, the choice for the learned societies' journals reduces the probability of publication biases nurtured by the selection of journals maintained by single departments whose publication screening processes might follow, as argued by Colussi (2018, p. 47-48) and Heckman and Moktan (2018, p. 5-6), particular internal logics.[10] And, at last, the American academy is still the one that holds the highest-ranked journals and faculty departments in economics (COUPÉ, 2003, p. 1337; HECK & ZALESKI, 2006, p. 1; KALAITZIDAKIS, MAMUNEAS & STENGOS, 2003, p. 1356-1357; KELLY & BRUESTLE, 2011, p. 660). Therefore, the journals taken to be the unit of analysis are: *American Anthropologist* (*AA*), *American Political Science Review* (*APSR*),

[10] Heckman and Moktan (2018, p. 53) argue that the tastes of editors and the biases of journals influence the publication screening process. This may create clientele effects and professional incest, raising the entry costs for new ideas and researchers outside the orbits of the journals and their editors. Colussi (2018, p. 49) endorses the view of editor favoritism towards the members of the editor's network at the expense of unconnected scholars.

American Sociological Review (*ASR*), *Psychological Review* (*PR*), and *The American Economic Review* (*AER*).

Within these flagship journals, we collect the bibliographic references at each original article to build our database. Then, we search for references to the top 25 journals of each social science—detailed below. As follows, our investigation seeks patterns of interdisciplinary *journal* citations flowing from the flagship journals to this group of representative publications. It does not consider sources outside the top 25 journals of each discipline. As Fourcade, Ollion, and Algan (2015) did, we perform our analysis using the statistical programming framework *R*, and most of our main functionalities pertain to the *bibliometrix* package (ARIA & CUCCURULLO, 2017). The citation database is compiled from the *Elsevier Scopus* and *Web of Science* (henceforth WoS) databases, which we managed to merge.[11]

Our time span ranges from 1959 to 2018, which is different from the periods Rigney and Barnes (1980) and Angrist et al. (2017) analyzed. We chose the year 1959 as starting point because it marks the first record of the word *interdisciplinarity* and its variations in economics, according to Scopus and WoS.[12] To analyze how economics' interdisciplinarity with the other social sciences evolved through time, we separated our time span in decades, from the 1960s (which includes 1959) to the 2010s (ending in 2018) and built a *dynamic* Top 25 Journal Ranking (henceforth T25) for each discipline. We qualify this T25 as dynamic because we constructed one ranking for each decade, with the objective of grasping each journal's influence in that specific time period. Moreover, we built our rankings based exclusively on the *inCites Journal Citation Reports*[13] (henceforth JCR)—maintained by *Clarivate Analytics*, the same corporation that holds WoS—, which orders journals in decreasing order of impact factor. There are, furthermore, three issues involving the construction of these dynamic rankings.

First, the dynamic rankings per decade are the arithmetic means of the year-by-year impact factors within each interval. We rely on the arithmetic mean of the simple journal impact factor because the 5-year impact factor was made available only from 2007 onwards. Second, the Social Science Citation Index JCR is only available from 1979 onwards—unlike the Science Citation Index JCR, which dates back to 1975 (GARFIELD, 2007, p. 65; NISONGER, 2000, p. 264; RICE, BORGMAN & REEVES, 1988, p. 258). This means that social sciences journal

[11] All the accesses to Scopus and WoS were performed in September 21st, 2018. Therefore, only the first three quarters of 2018 are covered in our sample.
[12] JSTOR delivers results that predate 1959, starting in 1940, but JSTOR does not allow us to disaggregate citation data as Scopus and WoS do. We will, for that reason, remain faithful to the results delivered by Scopus and WoS.
[13] Available at http://jcr.incites.thomsonreuters.com.

rankings as we know them do not have observations for the period 1959-1978. For this reason, we adopted the same retrospective ranking for the 1960s and the 1970s. The reference for this ranking is the triennium 1979-1981. We did not base this ranking on years farther away from 1979 in order to avoid biases caused by mid-1980s outlier observations. There is, moreover, a difference between the rankings for the 1960s and the 1970s related to journal coverage: journals that did not exist in the 1960s were kept solely for the 1970s ranking and replaced by the next highest-ranked journal covering the 1960s. Finally, in cases where we had a coincidence of journals for two different sciences, we eliminated that journal from the discipline in which it occupied a lower average position.[14] Accordingly, these journals were also replaced by the next highest-ranked publication.

3.2.3. The coefficient of interdisciplinary asymmetry

Asymmetry in interdisciplinary citations is loosely defined in Fourcade, Ollion, and Algan (2015, p. 93), Pieters and Baumgartner (2002, p. 498), and Rigney and Barnes (1980, p. 119). These works loosely use this concept to represent an absolute mismatch between two disciplines' reciprocal interdisciplinary citations. Rigney and Barnes (1980, p. 114), for example, understand asymmetry as the situation in which "one field cites another more often that it is cited in return." Pieters and Baumgartner (2002, p. 498, 503), on the other hand, thinking of asymmetry as "reciprocal citation relationships," present asymmetry in relation to the overall interdisciplinary citations of a discipline, but do not advance on this analysis.

Following this, in order to better understand the asymmetry patterns in social science interdisciplinarity, we designed something we called *Coefficient of Interdisciplinary Asymmetry* (henceforth CIA). The CIA is supposed to measure the relation between two disciplines in terms of reciprocal proportion of citations; it quantifies the importance of discipline *A* to discipline *B* in relation to discipline *B*'s importance to discipline *A*. Its formula for a given point in time is $CIA_{A,B} = \left(\frac{\sigma_B^A}{\theta_B}\right)\left(\frac{\theta_A}{\sigma_A^B}\right)$. This equation measures the asymmetry of

[14] Four journals were replaced in economics: *Scottish Journal of Political Economy* (1960s. remained in political science), *Problems of Communism* (1960s, 1970s, 1980s; remained in political science), *Journal of Human Resources* (1970s, 1980s; remained in sociology), and *Economy and Society* (2000s; remained in sociology). Four journals were also replaced in sociology: *Canadian Review of Sociology and Anthropology* (1960s, 1970s; remained in anthropology), *Journal of Politics and Military Sociology* (1970s; remained in political science), *Social Networks* (1980s, 1990s, 2000s, 2010s; remained in anthropology), and *Politics & Society* (1990s, 2000s; remained in political science). One journal was replaced in anthropology: *Human Ecology* (2000s, 2010s; remained in sociology). Finally, one journal was also replaced in political science: *Socio-Economic Review* (2010s; remained in sociology).

discipline *A* in relation to discipline *B*. In this formula, σ_B^A gives the number of citations to discipline *A* in discipline *B*, σ_A^B gives the number of citations to discipline *B* in discipline *A*, and θ_A and θ_B yield the total number of interdisciplinary citations in disciplines *A* and *B*, respectively. Therefore, it is a relation between the proportion occupied by disciplines *A* and *B* in the interdisciplinary citation network of each other. Once this is calculated, $CIA_{B,A}$ is given merely by the multiplicative inverse of $CIA_{A,B}$: $CIA_{B,A} = \frac{1}{CIA_{A,B}}$.

If $CIA_{A,B}$ equals one, we have that *A* plays a role in *B*'s network of interdisciplinary citations equivalent to the role played by *B* in *A*'s. For example, if, among the interdisciplinary citations of *A*, *B* is the target of ten per cent of *A*'s citations, a CIA equal to one tells us that *A* receives the same proportion of *B*'s interdisciplinary references. As such, values closer to one represent higher symmetry than those farther away. Alternatively, a $CIA_{A,B}$ greater than one means that *A* is more representative to *B* than *B* to *A*, while a $CIA_{A,B}$ less than one yields the opposite result. This relation can only be established between two disciplines at a time.

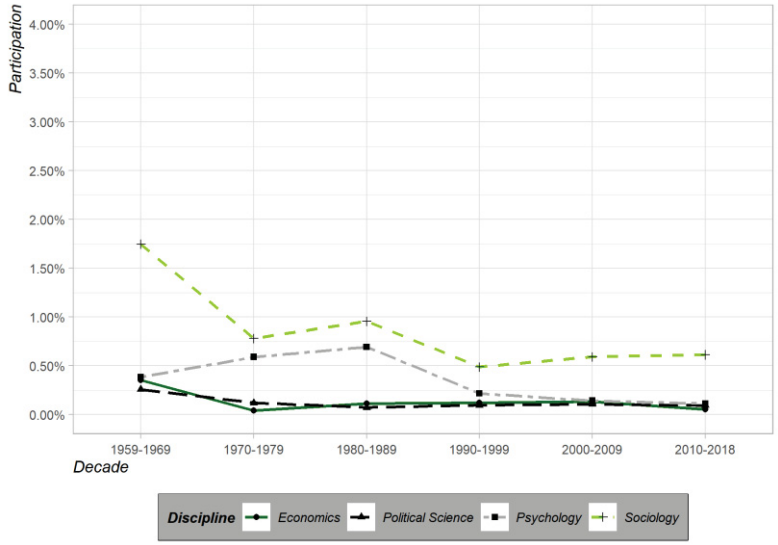
We believe the *CIA* to be more elucidating than the loose comparison between the absolute levels of interdisciplinary citations among disciplines because the latter does not take into account that disciplines present different institutional and historical patterns of interdisciplinarity. Since this difference exists, analyses of this sort almost inevitably present asymmetry towards the less interdisciplinary discipline, inasmuch as its propensity to cite the neighboring sciences is smaller. The *CIA*, *au contraire*, takes the different degrees of interdisciplinarity among disciplines as given. In this sense, each discipline's weight in relation to each other is measured exclusively *within* the interdisciplinary citations to the network. It is our claim, therefore, that the *CIA* allows us to effectively understand asymmetry patterns in terms of the relative relevance among two sciences of a given network.

3.3. RESULTS: THE EVOLUTION OF INTERDISCIPLINARITY WITHIN THE SOCIAL SCIENCES NETWORK

This section aims at presenting economics' degree of interdisciplinarity in relation to the social sciences and its patterns of intertemporal evolution. The main results to be detailed are: (a) the evolution of each discipline's openness to the other social sciences' T25; (b) the evolution of the citations in anthropology, political science, psychology, and sociology to the economics' T25 journals per decade; (c) the aggregated relations between the flagship journals and a group of core journals for each science; (d) the patterns of asymmetry in interdisciplinary

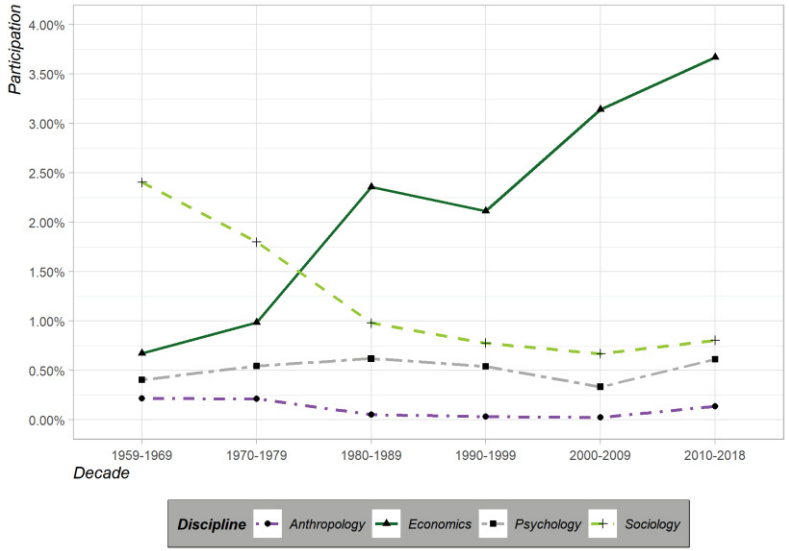
citations; and (e) the evolution of each discipline's references to the their own T25. Among these, (a) and (b) yield results that resemble the overall patterns presented by Angrist et al. (2017). Point (e) is close to Fourcade, Ollion, and Algan's (2015, p. 94) perception concerning economics' regard to the top of its internal hierarchy. Despite the prior discussions on these points, we believe our analyses offer new inputs and insights on the nature of these developments in terms of length and focus of our study. Evaluations (c) and (d), nonetheless, offer, to our knowledge, completely novel assessments to the structure of the interdisciplinary citations within the social sciences network. In this sense, graphs 2 to 7 serve illustrate the evolution of each discipline's degree of interdisciplinarity in relation to the social sciences.

Graph 2: The Social Sciences in the *AA*



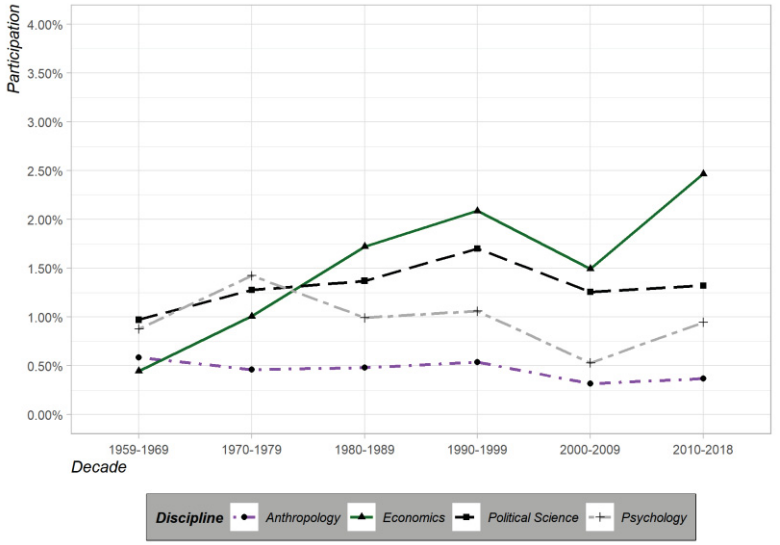
Source: Elaborated by the author from Scopus and WoS databases

Graph 3: The Social Sciences in the *APSR*



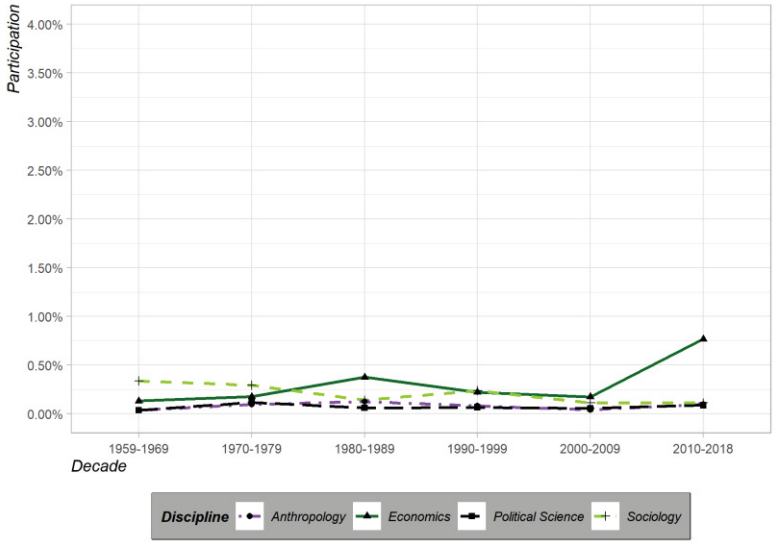
Source: Elaborated by the author from Scopus and WoS databases

Graph 4: The Social Sciences in the *ASR*



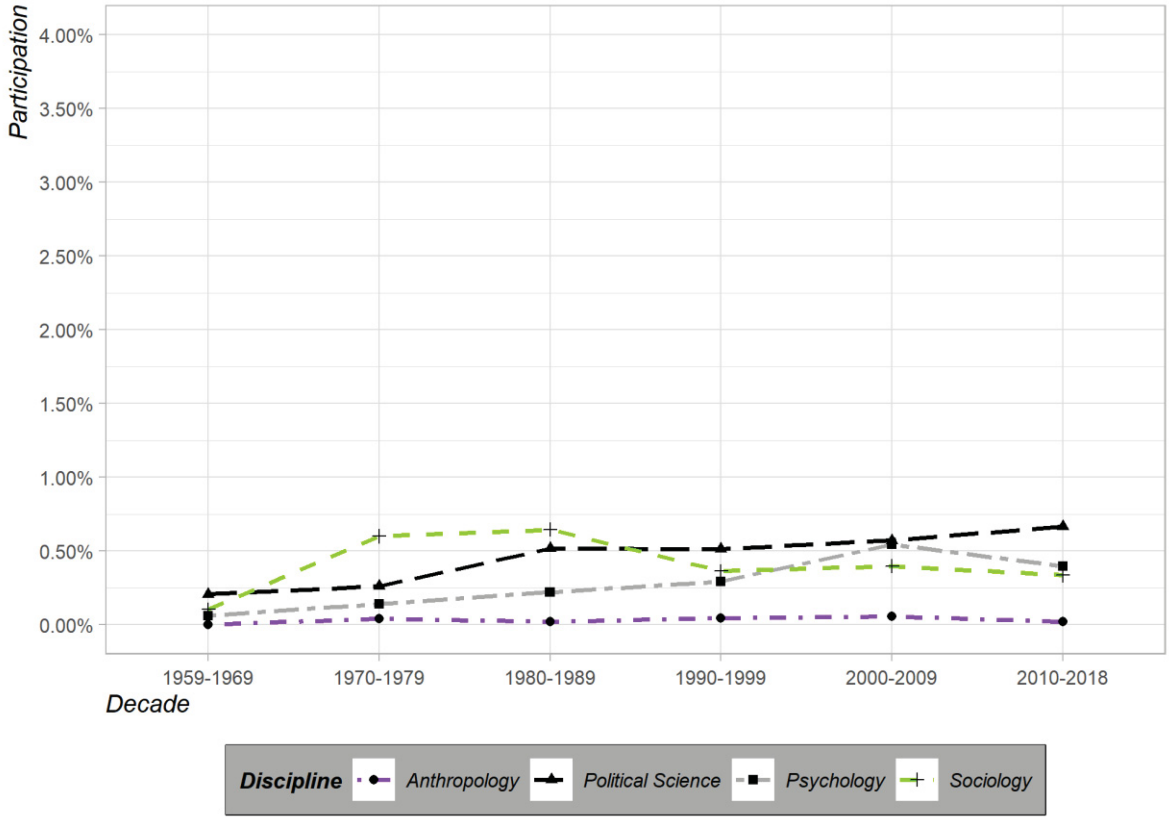
Source: Elaborated by the author from Scopus and WoS databases

Graph 5: The Social Sciences in the *PR*



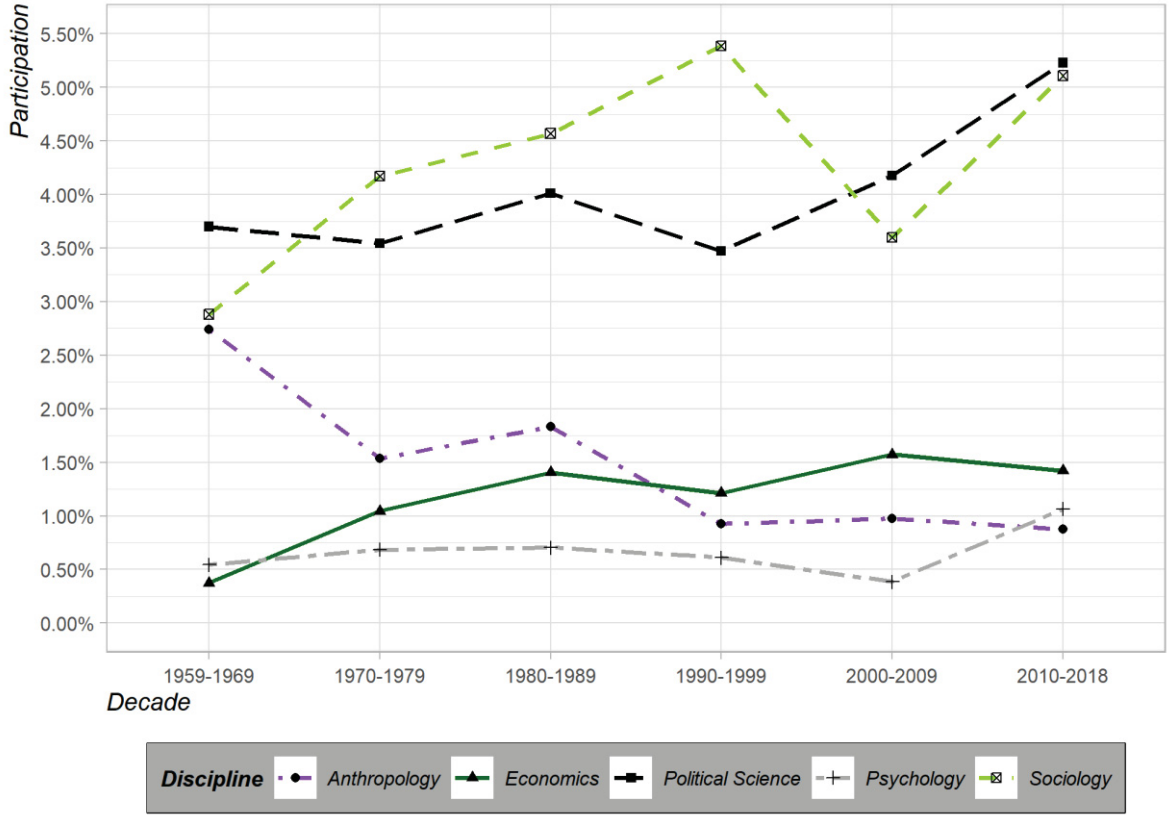
Source: Elaborated by the author from Scopus and WoS databases

Graph 6: The Social Sciences in the *AER*



Source: Elaborated by the author from Scopus and WoS databases

Graph 7: Openness to the Social Sciences in each flagship journal



Source: Elaborated by the author from Scopus and WoS databases

Graphs 2 to 6 treat how the individual T25s were cited in particular flagship journals. In these, each line represent the citations to one single alien discipline. Accordingly, graph 2 establishes the evolution of *AA*'s citations to the T25 journals of each discipline, with the exception of anthropology; graph 3 evaluates the progress of *APSR*'s citations to the highest-ranked journals of each discipline, with the exception of political science; and so forth. Angrist et al. (2017, p. 24) present similar graphs, whose identified tendencies graphs 2 to 6 corroborate.

Graph 7, on the other hand, aggregates each discipline's overall openness to the social sciences. Its lines represent how each individual flagship journal evolved in its citations to the aggregated T25 of the other social sciences. Once again, citations to a discipline's own T25 were not taken into consideration. This graph also finds a similar representation in Angrist et al. (2017, p. 23).

Collectively, these graphs offer two straightforward and elucidating perceptions. The first is that the overall openness of the social sciences to their sister disciplines has risen in the last sixty years, from 2.05%, in the 1960s, to 2.74%, in the 2010s—the peak throughout the six decades. This represents a growth of 33.74% in the average interdisciplinary within the social sciences network (with an average growth rate of 5.99% per decade). The second perception is that we may divide the social sciences in three classes of disciplines by interdisciplinarity status. The class of *growing high interdisciplinarity*, which kept its degree of interdisciplinarity growing and above the average overall interdisciplinary openness throughout the entire series. The class of *growing low interdisciplinarity*, whose interdisciplinarity levels grew along our time span but remained below the interdisciplinary average of the social sciences. And a class of *decreasing interdisciplinarity*, which presented its interdisciplinarity levels above the average line and had it shrunk to levels below it from certain decade onwards. The first class is composed by political science and sociology; the second class is made up by economics and psychology; the third class is concentrated on anthropology. These same three groups could be inferred from Angrist et al. (2017, p. 23)—even though the authors do not do it.

Political science and sociology answer for the highest degrees of interdisciplinarity. Their levels of interdisciplinarity are so relatively high, that their lowest decennial percentages (3.47% and 2.88%, respectively), never found themselves surpassed by the highest decennial percentages of the other three disciplines. In fact, if it were not for these two disciplines—i.e., if we eliminated them from our narrative—, the aggregated average of interdisciplinary openness of the social sciences would have decreased in the sixty years analyzed (from 1.22% in the 1960s to 1.12% in the 2010s). Additionally, in the 2010s, political science and sociology

combined answered for more than three-quarters (75.46%) of the interdisciplinary citations within the network.

Economics and psychology show low but intertemporally growing degrees of interdisciplinarity. Economics departs from 0.37% in the 1960s to reach 1.42% in the 2010s, while psychology departs from 0.55% and finishes with 1.06%. Economics departs from a lower degree of interdisciplinary openness and evolves prominently in relation to its first observation, nearly quadrupling it, while psychology's decennial percentages nearly double. Still, both economics and psychology remain below the average of interdisciplinary openness through all the decades (economics would find itself above the decennial averages from the 1980s onwards if political science and sociology were set aside in the calculation, as suggested above; psychology, however, would all the same remain below the new average throughout the entire account).

Anthropology, at last, is the only discipline whose degree of interdisciplinary openness decreased throughout our period of analysis. In the 1960s, anthropology found itself above the average of interdisciplinary openness, with 2.74% of its citations directed to its fellow social sciences. From the 1970s onwards, however, anthropology became progressively less prone to cite these disciplines, until it reached 0.88% in the 2010s, its lowest degree of social science interdisciplinarity in our sample.

On these grounds, table 1 compares the sampled points of departure and arrival of each science. Political science, sociology, and psychology did not have their positions altered between the 1960s and the 2010s, remaining in the first, second, and fourth positions, respectively. Economics, however, rose from the fifth to the third place, overriding psychology and anthropology. Anthropology, given its progressively decreasing regard for the social sciences, descended from the third to the fifth position—in Angrist et al.'s (2017, p. 23) remark, anthropology also presents decreasing levels of social science interdisciplinarity, but it manages to remain above the levels of economics and psychology in terms of interdisciplinary citations, from 1970 to 2015.

Table 1: The evolution of the social sciences in terms of interdisciplinarity

Position	**1960s**		**2010s**		**Δ%**	
	Discipline	%	*Discipline*	%	*Discipline*	%
1	Political Science	3.70%	Political Science	5.23%	**Economics**	279.65%
2	Sociology	2.88%	Sociology	5.11%	Psychology	95.33%
3	Anthropology	2.74%	**Economics**	1.42%	Sociology	77.31%

4	Psychology	0.55%	Psychology	1.06%	Political Science	41.32%
5	**Economics**	0.37%	Anthropology	0.88%	Anthropology	-68.07%

Source: Elaborated by the author

The first four columns, regarding the starting and final stages of interdisciplinary openness, are important to situate economics in relation to its fellow social sciences. Economics, accordingly, is much below political science and sociology in terms of interdisciplinarity citations to the other social sciences. This was true in the 1960s and it remains true in the 2010s. Economics, however, managed to improve its situation and to become more mindful of the social sciences than psychology and anthropology.[15] In the case of the latter, this is partially to blame on anthropology's contraction of its own interdisciplinarity levels. The escalation of economics' degree of interdisciplinarity *vis-à-vis* those of psychology, political science, and sociology, however, surpassing the first and reducing the gap with respect to the remaining two, is to be accredited exclusively to economics itself.

Among all the five disciplines, economics is the one that became more open in relation to its self-former levels. This is what the last two columns of table 1 show. As already presented, anthropology is the only discipline whose degree of interdisciplinary openness decreased. It had a growth rate of -68.07%. Among those whose interdisciplinary citations increased, psychology nearly doubled, growing 95.33%, while sociology and political science also grew significantly, having 77.31% and 41.32%, respectively, as growth rates. It must be noted that the latter two disciplines already departed from relatively high degrees of interdisciplinarity, which makes these numbers even more expressive. Economics, finally, even though it might be argued that its point of departure was ridiculously low, grew 279.65%. This means that, in the 2010s, within the universe of *AER* citations, articles originally published in the highly ranked journals of the alien social sciences occupied a space nearly four times bigger than they did in the 1960s. When we compare economics in the 2010s with economics in the 1960s, therefore, we do not have any option but to conclude that our study do not find enough substance to reject the hypothesis defended by Fontaine (2015, p. 3) and Mäki (2017) and measured by Angrist et al. (2017, p. 23-24): the attention of economics to the other social sciences—as long as the *AER* as a proxy is concerned—has indeed become more prominent.

[15] Interestingly, a measure of average journal turnover regarding each social science's T25 ranks the disciplines exactly as in the 2010s ranking in terms of interdisciplinarity. The journal turnover measures how much a discipline's T25 in a given decade differs from that discipline's immediately preceding T25. Accordingly, political science leads with the highest average turnover (36.67%), followed by sociology (30.67%), economics (28.67%), psychology (27.33%), and anthropology (22.67%).

This is however, a two-way street: if the attention of economics to its sister social disciplines has risen, the attention of the alien social sciences to economics has risen in return—and much more incisively. Table 2 compares these rates of growth. The overall openness of the social sciences went up 33.74%, with an average growth rate of 5.99% per decade, as aforementioned. Meanwhile, the citations of economics to the T25s of anthropology, political science, psychology, and sociology augmented 279.65%, with an average growth rate of 30.58%. At the same time, the average of citations to economics by the other social sciences grew 333.52%, with an average growth rate of 34.09% per decade.

Table 2: Growth rates per decade (economics and overall)

Decade	Average overall openness	Growth rate (Δ)	Average citations to economics	Growth rate (Δ)	Economics' openness	Growth rate (Δ)
1960s	2.05%	—	0.40%	—	0.37%	—
1970s	2.20%	7.20%	0.55%	37.88%	1.04%	179.14%
1980s	2,50%	14.05%	1.14%	106.42%	1.41%	34.55%
1990s	2,32%	-7.30%	1.14%	-0.47%	1.21%	-13.68%
2000s	2,14%	-7.77%	1.24%	8.71%	1.57%	29.65%
2010s	2,74%	27.95%	1,74%	40.77%	1.42%	-9.67%
Growth rate		33.74%		333.52%		279.65%
Average growth rate		5.99%		34.09%		30.58%

Source: Elaborated by the author from Scopus and WoS databases

This intertemporal evaluation further indicates that economics rose to the highest rank among the social sciences in terms of prestige in the 1980s, after an increase of 106.42% in citations directed to its T25. From this decade onwards, as displayed in graphs 2 to 5, economics became the most cited discipline in political science, psychology (both of which had had sociology as most cited discipline in 1960s-1970s),[16] and sociology (in psychology's stead)—the exception here is anthropology, in which sociology remained the most cited discipline from the 1960s to the 2010s.

This movement of economics towards the center of the social sciences network may be inferred from table 3 and graph 8. Table 3 contains information regarding the proportions of interdisciplinary (abbreviated as ID in the table) citations to and from economics. The first three

[16] Psychology's citations to economics oscillated in the following decades. In the 1990s, sociology was the most cited discipline in the *PR*, but economics reclaimed this position in the two following decades.

columns tell us that, among all the interdisciplinary citations to social sciences (abbreviated as SS in the table)—accounted by the simple addition of the absolute number of interdisciplinary citations—, the *AER* evolved from representing merely 2.19% in the 1960s to representing 19.23% in the 2010s—nearly one-fifth, among the five disciplines. The final three columns, alternatively, illustrate that economics, which represented 15.90% of all the anthropology, political science, psychology, and sociology interdisciplinary citations to neighboring social sciences in the 1960s, accounted for 56.01% of these citations in the 2010s. Naturally, the absolute number accounted here disregards the *AER* citations, because we are looking for interdisciplinary references, and *AER* citations to economics would constitute a case of *intra*-, instead of interdisciplinary interaction. Accordingly, these columns inform the reader that economics, from the 1990s onwards, became the target of more than half of the absolute number of interdisciplinary citations to the social sciences employed by anthropology, political science, psychology, and sociology. Still, if we had not disregarded the *AER* interdisciplinary citations, economics would significantly represent 45.24% of the interdisciplinary citations in our network—naturally, *AER* citations to economics were not taken into account.

Graph 8, on the other hand, shows that this rise in attention towards economics was more conspicuous in political science and in sociology, while anthropology actually contracted its utilization of citations to economics.

Economics' movement towards higher prestige before the social sciences coincides with what has been conventionally called "empirical turn[17] in economics," alleged to have taken place in the last decades of the twentieth century (BACKHOUSE & CHERRIER, 2017, p. 2). Hamermesh's (2013, p. 168) bibliometric investigation shows that a shift towards more empirical work in economics actually took place between 1983 and 1993. Angrist et al. (2017, p. 38), in addition, display a rise in the interest of the social sciences for economics' empirical works. It is interesting to notice, therefore, that economics' effective rise as the most prestigious social science coincides precisely with the steering of its attention towards empirical research. Notwithstanding the importance of this potential relation and the discussion opportunities available regarding this particular subject, there are numerous questions and puzzles circumscribed to this so-called empirical turn whose disputes escape the purpose of this essay.

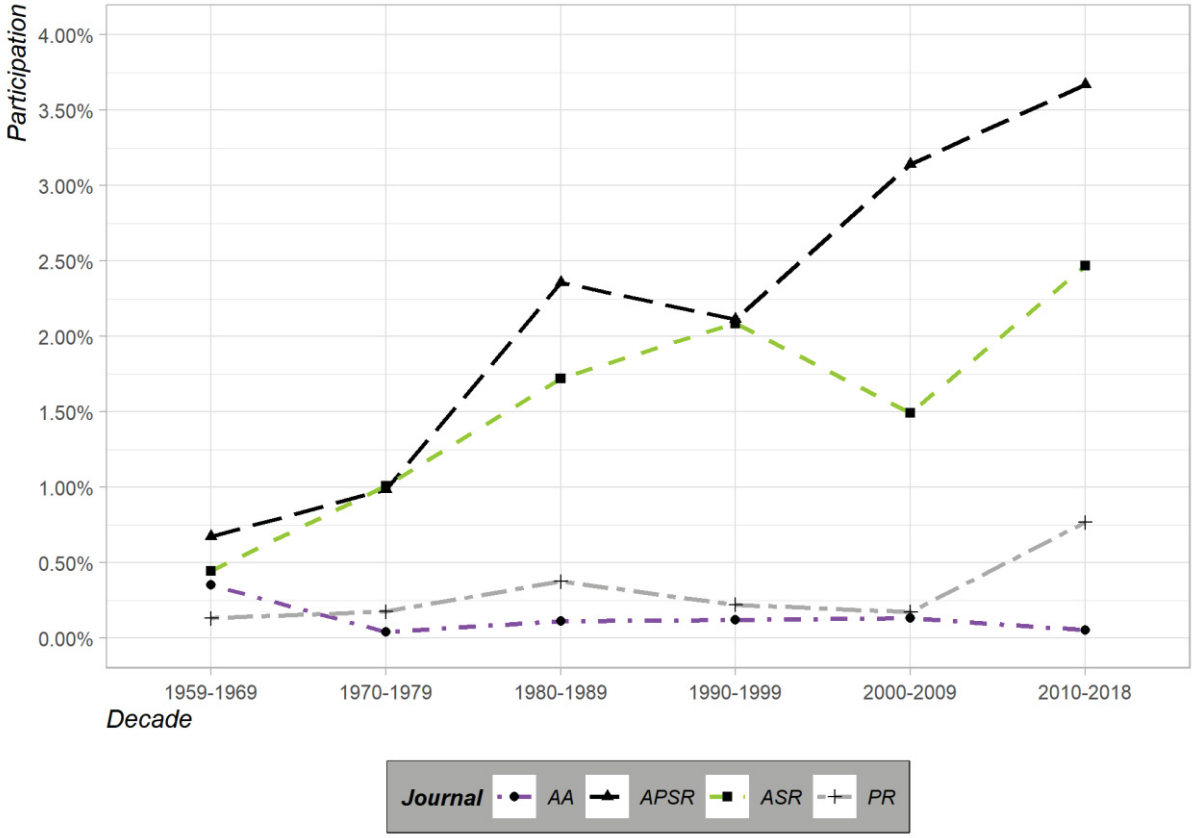
Table 3: The rise of economics' significance within the social sciences network

[17] Mäki (2017) defends that the terminology of *turns* is constantly used in a careless fashion, causing the term to lose its meaning.

Decade	SS Overall ID citations (with economics')	Economics' ID citations to the SS	Economics' ID citations within the SS network	SS Overall ID citations (without economics')	Overall ID citations to economics from the SS	ID citations to economics within the SS network
1960s	823	18	2.19%	805	128	15.90%
1970s	1,589	132	8.31%	1,457	340	23.34%
1980s	1,982	209	10.54%	1,773	779	43.94%
1990s	2,017	220	10.91%	1,797	809	45.02%
2000s	1,978	390	19.72%	1,588	818	51.51%
2010s	2,564	493	**19.23%**	2,071	1,160	**56.01%**

Source: Elaborated by the author from Scopus and WoS databases

Graph 8: References to economics' T25



Source: Elaborated by the author from Scopus and WoS databases

A comparison between graphs 6 and 8 yields a source for introducing the asymmetric relations between economics and the other social sciences, presented especially by Fourcade, Ollion, and Algan (2015, p. 94). The comparison between these graphs allows us to pair economics with each one of the other four disciplines per decade. This gives us twenty four pairing observations, summarized in table 4. The first column in each box gives economics' citations to the paired discipline, while the second column gives the opposite relation. The

higher percentages in each comparison are in bold. In twenty two out of the twenty four observations, economics' space in the paired social science is bigger than the space of the paired social science in economics. The only exception is psychology both in the 1990s and 2000s.

Table 4: Unweighted asymmetric relations between Economics and the fellow Social Sciences

Decade	Economics vs Anthropology		Economics vs Political Science		Economics vs Sociology		Economics vs Psychology	
1960s	0.000%	**0.354%**	0.208%	**0.675%**	0.104%	**0.445%**	0.062%	**0.132%**
1970s	0.040%	**0.043%**	0.261%	**0.986%**	0.602%	**1.008%**	0.142%	**0.177%**
1980s	0.020%	**0.112%**	0.518%	**2.358%**	0.646%	**1.723%**	0.222%	**0.376%**
1990s	0.044%	**0.122%**	0.513%	**2.115%**	0.364%	**2.088%**	**0.292%**	0.223%
2000s	0.056%	**0.132%**	0.573%	**3.142%**	0.399%	**1.494%**	**0.545%**	0.175%
2010s	0.020%	**0.054%**	0.666%	**3.669%**	0.337%	**2.468%**	0.398%	**0.769%**
Growth rate	--	-84.84%	220.20%	443.36%	224.36%	454.66%	537.63%	484.10%
Average growth rate	--	-31.43%	26.21%	40.29%	26.53%	40.87%	44.85%	42.33%

Source: Elaborated by the author from Scopus and WoS databases

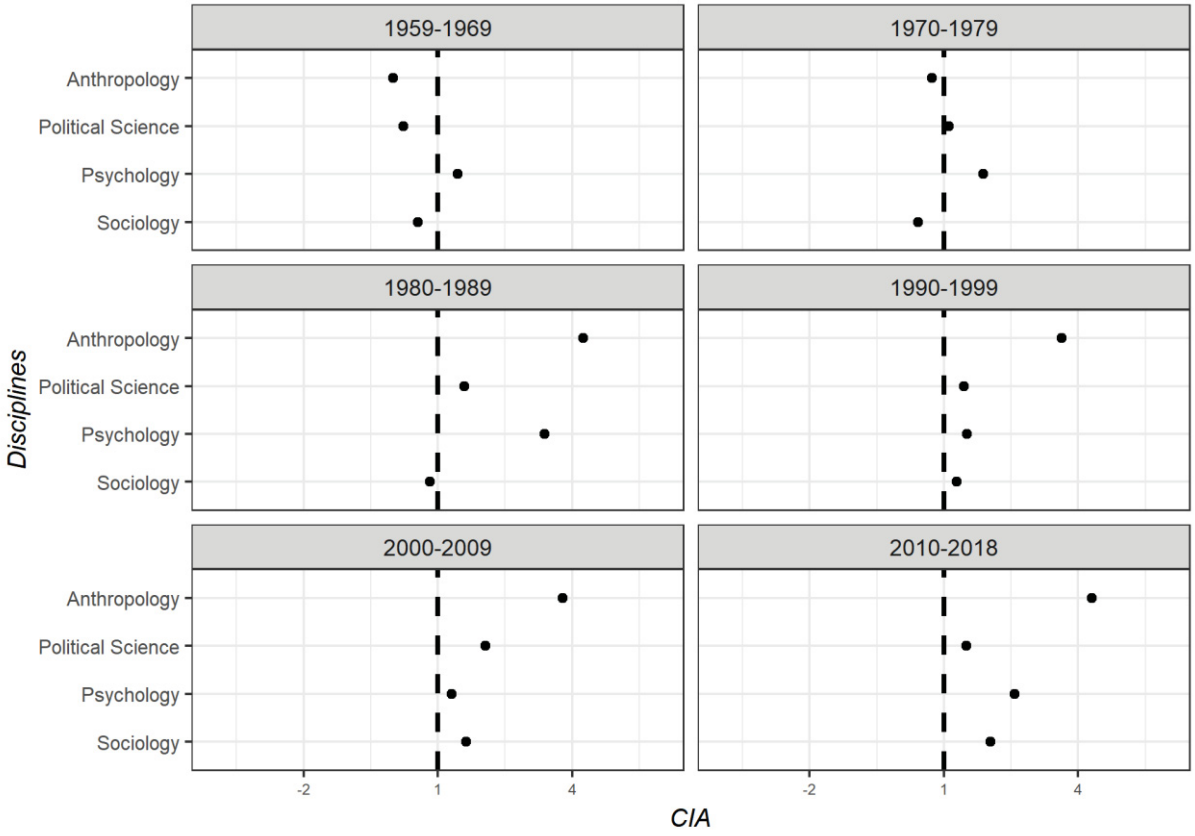
From this table, it is straightforward that economic knowledge flows into the other social sciences more than the contrary. In percentage terms, we find that economics began our series as more important to each alien discipline than each alien discipline to economics, and that this relation remained nearly untouched across time.

In terms of growth rates, anthropology's citations to economics is the only one to have decreased, at an average of 31.43% per decade—still, economics never cited anthropology more than anthropology cited economics in any given decade. Political science's and sociology's growth of citations to economics were much more prominent than the opposite. Psychology, alternatively, grew in significance to economics more than economics to psychology. Given that economics' representation in psychology's articles remained higher than psychology's representation in economics' articles (exception made to the 1990s-2000s observations), one might loosely infer that this movement actually represented a reduction of the asymmetry between economics and psychology, or that the asymmetry took place towards psychology in 2000s-2010s.[18]

[18] Exclusively in mathematical terms, we could also say that economics asymmetry with anthropology was reduced between the 1960s and the 2010s. However, this is the case because there was *no* citation to

However, this result is unweighted for interdisciplinary citations within the social sciences network. In order to further our understanding of the asymmetry patterns, we must resort to the CIA. Accordingly, graph 9 offers a visualization of how economics' asymmetry with the neighboring social sciences evolved between the 1960s and the 2010s.

Graph 9: Economics' *Coefficient of Interdisciplinary Asymmetry*



Source: Elaborated by the author from Scopus and WoS databases

The information displayed in graph 9 is read as follows: the closer a point is to the dashed line in the center of each facet (which represents $CIA = 1$), the more symmetric is the relation between economics and the indicated sister discipline. Points to the left of the line mean that economics is *less* representative for that science than otherwise—*asymmetry outwards economics*. Points to the right of the symmetry line, on the other hand, mean that economics' weight in the interdisciplinary citations to the social sciences in that specific discipline is greater than the opposite—*asymmetry towards economics*. The graph, accordingly, shows us that economics weighted less on the social sciences' interdisciplinary citations in the 1960s than the opposite, with the exception of psychology. In fact, psychology is the only discipline in which

anthropology in the AER during the 1960s. From the 1970s onwards, we find an actual decrease in economics' citations to anthropology as well.

asymmetry was never outwards economics. In the 1970s, economics grew in significance within the network, and an asymmetry towards economics surfaced in political science. In the 1980s, only sociology kept a pattern of asymmetry outwards economics. From the 1990s onwards, sociology joined the other disciplines and all the observations now give us asymmetry towards economics.

There is a further aspect regarding this graph that inspires caution. A difference exists between economics' relatively symmetric relations with, for example, both sociology in the 1980s and anthropology in the 1970s. While the former is symmetric because sociology was as important to economics as economics to political science in the 1980s, the latter is symmetric because anthropology was as *un*important to economics as economics to anthropology in the 1970s. Therefore, again, we must reiterate that these plots represent reciprocal importance within the network, not absolute relevance of disciplines to each other.

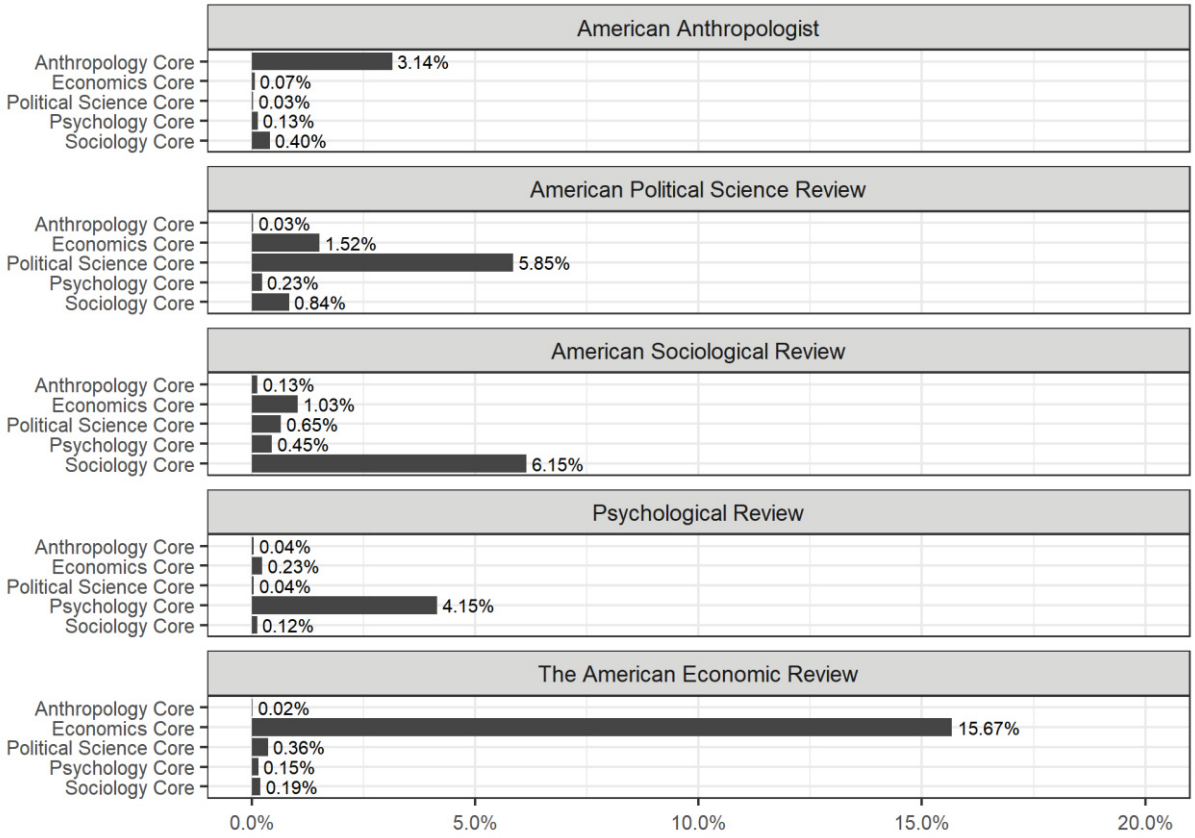
It also does not mean that a rise in asymmetry towards economics indicates that economics became more cited in that discipline in absolute terms. It means that economics rose in *significance*. Accordingly, this can also be a product of a discipline's reduction in citations to *other* social sciences. This is the case, for example, for psychology, whose citations to political science and sociology decreased across time. We have seen that the number of *AER* citations to psychology have grown more than the number of *PR* citations to economics. Still, the asymmetry towards economics in relation to psychology was enlarged between the 1960s and the 2010s.

Furthermore, an additional and elucidating investigation arises from citations to what we defined here as *Core Journals*. The results are summarized in graph 10. The core journals of a discipline are taken to be those that appeared in the T25 of that discipline in all the decades analyzed here, from the 1960s to the 2010s. All the disciplines have closely the same number of core journals, which range from four to six. Economics has six core journals (*AER*, *Econometrica*, *Economic Geography*, *Journal of Political Economy*, *Quarterly Journal of Economics*, and *Review of Economic Studies*).[19] Psychology (*Advances in Experimental Social Psychology*, *Annual Review of Psychology*, *Psychological Bulletin*, *PR*, and *Psychosomatic Medicine*) and sociology (*American Journal of Sociology*, *ASR*, *British Journal of Sociology*, *Journal of Marriage and the Family*, and *Social Problems*) have five core journals. Finally,

[19] Five of the six journals in our list are present in the frequently used Blue Ribbon Eight list of journals. The only exception is *Economic Geography*. The three journals in Conroy et al.'s (1995, p. 1966) Blue Ribbon Eight ranking absent from our list of Core Journals are *International Economic Review*, *Journal of Economic Theory*, and *Review of Economics and Statistics*.

political science (*American Journal of Political Science*, *APSR*, *Journal of Conflict Resolution*, and *Journal of Politics*) and anthropology (*American Anthropologist*, *American Journal of Physical Anthropology*, *Current Anthropology*, and *Journal of Human Evolution*) have four core journals.

Graph 10: Unweighted references to Core Journals



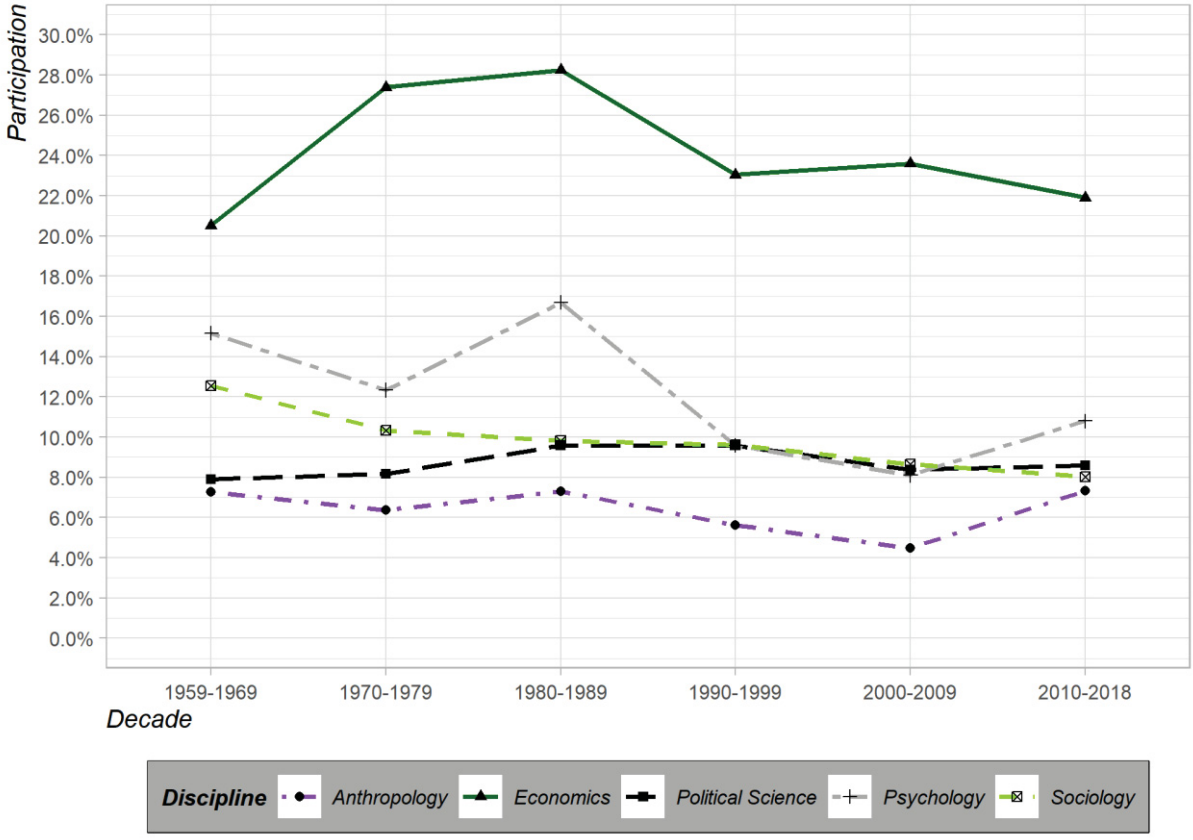
Source: Elaborated by the author from Scopus and WoS databases

Graph 10 does not weight the references for interdisciplinary citations to the social sciences. This is intended to offer, beyond the recognition of the overall interdisciplinary citations to key journals, a point in case regarding the disciplines' citations to their *own* cores as well. From this graph, we may realize that, in regard to unweighted overall citations, economics' core is the most representative one for political science (1.52%), psychology (0.23%), and sociology (1.03%). For economics, on the other hand, the political science core is the most representative one (0.36%). These results endorse the weighted investigation, which places economics as the most relevant social science citation-wise within the network, and political science as the discipline to which economics directs more attention. Moreover, once again, we can easily identify political science and sociology ahead of anthropology, economics, and psychology in terms of citations to its neighboring disciplines. It is worth highlighting,

nonetheless, that anthropology and psychology are worse off than economics in terms of social science interdisciplinarity.

Additionally, it is important to realize the significantly higher percentage of economics' citations to its *own* most prestigious journals. While the other four disciplines have the citations to their own cores ranging between 3.14% and 6.15%, economics' resort to the economics core is 15.67%. This corroborates Fourcade, Ollion, and Algan's (2015, p. 96) realization that economics, besides looking more inward than the other social sciences, also displays a much higher reliance on knowledge produced at the top of its internal hierarchy. This relationship is illustrated in graph 11. This graph presents each discipline's citations to its *own* T25 across the decades. The much higher level in which we find economics is likely to represent that economics has much more regard to the top of its internal hierarchy than do the other four disciplines.

Graph 11: Disciplines citations to their *own* T25



Source: Elaborated by the author from Scopus and WoS databases

This graph points to the fact that, in relation to the social sciences, the most prestigious economics journals occupy a much more central position in the network of intradisciplinary knowledge transmission. Accordingly, it is remarkable that, even though knowledge produced

in other sources has, by definition, less space to be preserved and replicated within the discipline, economics managed to become a more interdisciplinary social science in relation both to itself and to anthropology and psychology. We have a lot of ground to cover, if we want to become as welcoming to social science knowledge as political science and sociology, but we cannot deny that our situation has been improved in such matters.

3.4. DISCUSSION

A study like this is unlikely to be free of particular limitations, beyond the general ones remarked by Cherrier and Svorencik (2018, p.368, 372). First, even though citations to periodical literature are a useful market-based measure of research quality, they are imperfect measures of interdisciplinary influences[20] (HAMERMESH, 2018, p. 125; RIGNEY & BARNES, 1980, p. 116). The results here, therefore, ought to be interpreted cautiously. Second, we restricted our analysis to the flagship journal of each social science—and, no matter how well justified this process may be, it is perhaps the greatest particular limitation of our analysis. Third, the citation patterns analyzed comprise uniquely journal *articles*. Other sources such as books, book reviews and conference proceedings are entirely absent in our sample. This might be debilitating, because book reviews tend to occupy a privileged position in citation index reports, while books and conference proceedings are very important as sources of scholarly knowledge (HU et al., 2018, p. 1134; PIETERS & BAUMGARTNER, 2002, p. 505). Fourth, our ranking definitions for the T25 articles in each social science per decade had to extrapolate impact factors listed between 1979 and 1981 all the way back to 1960s. The implicit assumption here is that the influence of the journals remained unaltered from the 1960s to the early-1980s. Finally, there are many factors that influence one discipline's citations to another, in addition to the influence of the cited discipline *per se*. Among these, Rigney and Barnes (1980, p. 125) highlight the observed scientific status of the cited discipline, the perceived relevance of the cited discipline's subject matter, and the amount of literature available for citation. These factors escape our analysis.

Still, despite these shortcomings, the findings of this essay are compelling in two senses. First, our results excavate the asymmetry of knowledge transfer between economics and the social sciences found in the literature: anthropology, political science, psychology, and

[20] Citations and publication follow many other criteria that transcend the search for quality ideas. For a fuller comprehension of the subtleties behind these processes in economics, see Laband and Piette (1994), Kapeller (2010), Brogaard, Engelberg, and Parsons (2014), Colussi (2018), and Heckman and Moktan (2018).

sociology resort more to economics than economics to each one of them. This pattern was intensified in the last sixty years, especially from the 1980s onwards. This result is given both by the absolute number of citations and by economics' CIA with each one of the sister disciplines. Second, the results also point that three classes of disciplines may be distinguished: one of growing high interdisciplinarity (political science and sociology), one of growing low interdisciplinarity (economics and psychology), and one of decreasing interdisciplinarity (anthropology). This shows that economics has space to intensify its interdisciplinary ventures, but that it is not—as the prior particular impressions of this author had him believe—the most insular social science.

Therefore, the main conclusion of this essay should be read parsimoniously in the following sense. If we rely on the American associations' flagship journals as proxies for entire disciplines, understand journal articles as the main sources of knowledge diffusion, and count the best-ranked journals as more pervasive influences, the estimates laid down in this study indicate that, between 1959 and 2018, economics has become (a) a more interdisciplinary social science—even though the openness to economics in the social sciences grew much more acutely than the openness to the social sciences in economics—; and (b) the most important discipline within the social sciences interdisciplinary network. Nevertheless, the percentages of economics' openness to the social sciences remain below the average interdisciplinarity within the social sciences network all along our time span (from 0.37% *vis-à-vis* 2.05%, in the 1960s, to 1.42% *vis-à-vis* 2.74%, in the 2010s).

This conclusion includes the perception that economics rose from the fifth to the third position in terms of interdisciplinarity within the social sciences network—and this goes against the usual portrait of economics as the least interdisciplinary social science, as Fontaine (2015, p. 3) punctuates. Additionally, it is interesting to notice that this rise contradicts the survey conducted in 2006 and reproduced by Fourcade, Ollion, and Algan (2015, p. 95), according to which economists are the only professionals (in comparison with sociologists, historians, political scientists, financists, and psychologists) whose majority believe knowledge obtained by a single discipline to be better than interdisciplinary knowledge.

Furthermore, between 1936 and 1975, Rigney and Barnes (1980, p. 122) identified that "[…] the only social science discipline that has cited economic literature to any important degree is political science, followed at a distant by sociology." Our results show that, from 1959 to 2018, there was a change in this picture, especially from the 1980s onwards, when economics became the most cited discipline in political science, psychology, and sociology—anthropology here, as in other aspects of our study, is a particular case. The average participation of

economics in the citations employed by the four remaining social sciences grew from 0.40% in the 1960s to 1.74% in the 2010s, which marks a growth of 333.52%.

These conclusions are in line with part of the literature on the subject, which places economics precisely in this progressive state of interdisciplinarity. Fontaine (2015, p. 3), for example, defends that, even though economists misinterpret interdisciplinarity for economics imperialism, economics "has appeared more cross-disciplinary than expected" from World War II onwards. Bögenhold (2018, p. 1126), in addition, insightfully concludes that *pari passu* with the decline in sociology's public reputation, economics embraced the earlier discussions on the social dimension of economic behavior, moving toward the other social sciences.

Finally, in a 2017 *American Economic Association* discussion panel,[21] which examined publishing and promotion in economics, Angus Deaton asserted that economics, in relation to other fields, is a relatively open discipline. Our data show that economics is not among the most open social sciences, but that Deaton is not wrong: economics is not the most insular as well. George Akerlof, alternatively, defended that there is almost a total disconnect between economics and sociology and that, perhaps, some combination of both would be more appropriate to deal with the type of situations economists tend to look at. We believe this idea to be extendable to all the social sciences analyzed in this essay. Strictly speaking, the data have shown that economics is indeed paying more attention to these disciplines, getting therefore closer to Akerlof's ideal. As Angrist et al. (2017, p. 22) postulate in their conclusion, "[…] economists are also increasingly likely to read other social sciences. […] economic scholarship has never been more exciting or useful than it is today." Evaluating the substance of economics, however, it is straightforward that the economics profession, if it aims at honoring Akerlof's plea and follow the examples laid down by political science and sociology, still has a long way to go.

3.5. FINAL COMMENTS

This essay represents the amalgam of two subjects dear to these authors: the study of economics as an interdisciplinary social science and the application of quantitative methods to further our understanding on the history of economics. We genuinely believe our field could benefit from both enterprises. In relation to the general trends Fontaine (2015), Angrist et al. (2017), Mäki (2017), and Bögenhold (2018) identified and our study confirmed, we see

[21] Available at https://www.aeaweb.org/webcasts/2017/curse. The participants were George Akerlof, Angus Deaton, Drew Fudenberg, Lars Hansen, and James Heckman.

promising research opportunities. Given the wide range of our analysis, we were not able to scrutinize particular movements throughout the history of economic thought in terms of social science interdisciplinarity. We hope, nonetheless, this paper may instigate some more focused analyses. If nothing else, this might help us understand the particular events that, taken together, constitute the overall movement detailed in this study.

4. ESSAY 3: A COHERENTIST DEFENSE OF ECONOMICS AS AN INTERDISCIPLINARY SOCIAL SCIENCE

4.1. INTRODUCTION

In an influential paper published in 2015, Marion Fourcade, Etienne Ollion, and Yann Algan discuss the superiority of economists. The primary objective of their paper is to "explore the shifting relationship between economics and the other social sciences" in four measures: insularity, hierarchy, network of affiliations, and social influence (FOURCADE, ALLION & ALGAN, 2015, p. 91). Our concern in this essay is the insularity—or lack of interdisciplinarity—of economics. In this particular regard, the aforementioned authors conclude that, even though all disciplines are somewhat insular, economics is indeed more insular than the other social sciences (FOURCADE, OLLION & ALGAN, 2015, p. 91). Through Jacobs' (2013, p. 82) estimates, they argue that the isolation of economics markedly stands out. The citation patterns show that economics has 80.9 percent of within-field citations, while political science, anthropology and sociology have 58.7, 52.8 and 51.9 percent. In relation to political science and sociology, the authors also claim—taking major journals of the American learned society for each discipline as proxies—that economists' citations to other social scientists are much rarer than the opposite (FOURCADE, OLLION & ALGAN, 2015, p. 94).

From a Bourdieusian perspective (BOURDIEU, 1984, p. 467-470), we could argue that this insularity arises from economics' failure to recognize knowledge created in other social sciences as worthy as its own and reinforces the dominance structure of economics among the social disciplines. Fourcade, Ollion and Algan recognize this state of affairs in the conclusion of their essay: "That confidence [of economists on economic knowledge and on themselves] is perhaps the greatest achievement of the economics profession—but it is also its most vulnerable trait, its Achilles' heel" (FOURCADE, OLLION & ALGAN, 2015, p. 111). The authors, however, do not demonstrate why the disregard for the social sciences results in an actual shortcoming for economics, and this is precisely the aim underlying this essay.

Thus, our objective is to provide a philosophical account justifying why economics should be a more interdisciplinary social science. It is a normative endeavor—as presented by Wedgwood (2013)—in the sense that it concerns what economists ought to think or do, or have reason to think or do. More specifically, this essay demonstrates the reasons economists have to both conceive and practice their discipline in an interdisciplinary way. Therefore, our

normative remarks tackle the issue of how economics could be best thought and put into effect: interdisciplinarity.

This essay is the defense of economics' interdisciplinarity in relation to the social sciences, which does not mean that economics disregards—or should disregard—other areas of knowledge. It means that we believe that disciplines whose ontological roots are essentially social and should look for further insights in each other, instead of enshrining their particular concerns.

The philosophy of science we use to ground this defense is the coherentist theory of justification, brought to light by Laurence BonJour (1985) in the book The Structure of Empirical Knowledge. With BonJour's philosophical framework, we present a justification for economics to be more mindful of its fellow social sciences as a means to understand social phenomena—economics' raison d'être as a social science—more thoroughly.

To attend this purpose, this essay counts with four sessions beyond this introduction. Section 4.2 performs a review of the literature both on interdisciplinarity and on the relation between economics and interdisciplinarity. It also presents the sort of interdisciplinarity we defend. Section 4.3 presents BonJour's coherentist approach to justification. Section 4.4 applies BonJour's philosophy of science to the defense of economics as an interdisciplinary social science. Finally, the final section presents some concluding remarks.

4.2. INTERDISCIPLINARITY AND ECONOMICS

This section discusses the literature on interdisciplinarity, both at a general level and within the economics profession. It is divided in two other sections. Section 4.2.1 presents some landmark concepts in the discussions about interdisciplinarity and defines the *kind* of interdisciplinarity we defend. Section 4.2.2 reviews the literature relating interdisciplinarity and economics.

4.2.1. Disciplines and interdisciplinarity

The definition of interdisciplinarity demands the prior establishment of what constitutes a discipline (HECKHAUSEN, 1972, p. 83). The formal definition of discipline adopted here is grounded on Wallerstein (2003, p. 453). As such, *disciplines* are (i) *intellectual categories* responsible for defining, given their object, both the existence and the boundaries of different areas of study; (ii) *institutional structures* that answer for the formal organization of these areas

since the late nineteenth century; and (iii) *cultures* that conform the experiences and exposures of its practitioners to a closed set of events. In this sense, roughly, any intersection between the dimensions of one discipline with another marks the existence of cross-disciplinarity.

Noticeably, cross-disciplinarity is a term used in a generic fashion to represent any connection between two or more disciplines, with no further qualification whatsoever. The differences in degree of these connections are described by more specific and well-defined concepts, used to denote and delimitate knowledge exchange between different disciplines. The most usual ones are multidisciplinarity, transdisciplinarity, and interdisciplinarity, and their qualification is important to define the nature of our defense.

First, multidisciplinarity represents approaches that juxtapose disciplines independently, fostering wider knowledge and methods, but keeping disciplines entirely apart. It is associated with the words juxtaposing, sequencing, and coordinating. Second, transdisciplinarity answers for the unification of a system of axioms between two or more disciplines, reaching an overarching synthesis usually translated in a new discipline. It is associated with the words transcending, transgressing, and transforming. Interdisciplinarity, finally, consists in the proactive interaction between disciplines, integrating designs and restructuring existing approaches. It is associated with the words integrating, interacting, linking, focusing, and blending (KLEIN, 2010, p. 16-18, 24). This last sort of cross-disciplinary exchange is the one we defend here. Our predilection for interdisciplinarity is justified in section 4.4, through BonJour's coherentist theory.

Nonetheless, defending interdisciplinarity does not translate into advocating the end of separate disciplines. Klein (2000, p. 7) and Weingart (2000, p. 40), for example, defend that there is no paradox in promoting disciplinary exchange *within* a scientific framework in which knowledge is segmented into disciplines. As wrote Hübenthal (1994, p. 57), "the task of interdisciplinarity research is not to be solved with a global interdisciplinary theory. […] rather it should find increasing acceptance within the individual sciences in daily usage." Interdisciplinarity and specialization are mutually reinforcing strategies in the process of knowledge production and, therefore, should be parallel efforts. In consonance with this, we must offer a preliminary account—to be complemented in section 4.4—of the *properties* of interdisciplinarity we attempt to defend here. Following Klein's (2010) taxonomical evaluations of the subject, the three pillars of interdisciplinarity present in our argument are: (A) *integrated theoretical interdisciplinarity*; (B) *supplementary methodological integration*;

and (C) *critical interdisciplinarity*.[22] The practice of economics as an interdisciplinary social science defended here lies in the intersection of these sets.

Integrated theoretical interdisciplinarity depicts the situation in which concepts and insights of one discipline offer alternatives to problems and theories of another (BODEN, 1999, p. 20). For Klein (2010, p. 20), this cooperation may alter original disciplinary methods and theoretical concepts. Boden (1999, p. 20-21) further argues that she believes this to be the *only true interdisciplinarity*, because integrated interdisciplinarity is both the rarest and the most intellectually exciting form of interdisciplinarity. Methodologically, this integration ought to be supplementary, increasing the sophistication in the borrowing of methods and concepts as a means to *develop an enduring mutual dependence* (KLEIN, 2010, p. 19). To these integrated approaches to method and theory, critical interdisciplinarity adds a sharp stand: it demands that interdisciplinarity *questions the dominant structures of knowledge and education* with the explicit objective of remodeling them (KLEIN, 2010, p. 23).

The kind of interdisciplinarity we defend for economics, therefore, may be summarized in the following short statement. *Economics*, *recognizing the epistemic advantages of interdisciplinary knowledge,* should *challenge and remodel the epistemological structure of economic reasoning, by means of an enduring integration of its methods and theories with those of the other social sciences*.

4.2.2. Interdisciplinarity and economics

Hvidtfeldt (2018, p. 2) defends that academic interest in interdisciplinarity has grown. A simple bibliometric exercise shows that, within economics, this was not different. In the Web of Science (henceforth WoS) database, out of the overall articles published within the profession, economics articles containing either the words *interdisciplinarity* or *interdisciplinary* evolved from 0,059%, in 1959,[23] to 0,383%, its high-water mark, in 2017. This does not mean strictly that economics has become more interdisciplinary. It simply represents that these terms have become more current. Furthermore, this percentage shows that economics is still at a very incipient stage regarding interdisciplinarity.

[22] Klein (2010) catalogs many more sets of properties. This characterization occurs generally in pairs of opposites. For the sake of space, we focus on the properties that are closest to the idea of interdisciplinarity defended here.
[23] The year 1959 marks the first appearance of the term in economics articles in the WoS. All the searches on the WoS outlined throughout this essay were performed on August 13th, 2018.

A bibliographic research—concentrated on the papers published from 2000 onwards, and, naturally, on the discussions that relate economics to the other social sciences—shows that these discussions approach the subject in a variety of ways. This recapitulation does not intend to be extensive more than it intends to highlight some guidelines in the ways economists have approached the subject in recent years.

In the realm of the rare quantitative essays on the subject, the already mentioned one by Fourcade, Ollion and Algan (2015) stands out. Also worth mentioning, there are Pieters and Baumgartner (2002) and Angrist et al. (2017). The former evaluates the communication patterns within economics journals and between these journals and the social sciences by means of citation analysis. In this latter regard, Pieters and Baumgartner (2002, p. 504) conclude that, from 1995 to 1997, there was an uneven exchange of knowledge: economics penetrated its sister disciplines much more than the contrary (PIETERS & BAUMGARTNER, 2002, p. 504). The latter estimates the evolution of extramural citations to and from economics. This exercise is done in relation to other sixteen disciplines. Angrist et al. (2017, p. 22) conclude that economics has become more interdisciplinary between 1970 and 2015 and more likely to read and cite the other social sciences. Their study also shows, nonetheless, that economics' levels of extramural citations to the social sciences remain much below those of political science and sociology, for example.

Beyond these, there is a multitude of related subjects discussed. Hollingsworth and Müller (2008) discuss the relation between the changing scientific *status quo* and interdisciplinarity. Cedrini and Fontana (2017), Fine (2008), and Szostak (2008) present the marginal space occupied by interdisciplinarity within the mainstream community. Bögenhold (2017) and Cavalieri (2016) explore the interdisciplinary relations between economics and sociology. Mäki (2009) and Mäki and Marchionni (2011) explore the matter of economics imperialism. Downward and Mearman (2007) propose the elimination of disciplinary boundaries and the establishment of one all-encompassing interdisciplinary social science. Emmett (2010) reconstructs the history of the Committee on Social Thought, in Chicago, and its role in the development of each discipline. Kuorikoski and Ylikoski (2010) argue that cross-disciplinary ventures might be innocuous, if loosely executed. And Bigo and Negru (2011) and Rol (2008, 2012) transcend the intellectual frontiers to explain some actual gains social science interdisciplinarity might bring to society. Furthermore, the literature on economics imperialism also touches the subject of interdisciplinarity, but, given its focus on the primacy of economics over the other social sciences, our normative analysis dispenses its presentation.

These examples are comprehensive, in the sense that they cover a lot of ground, but they offer some unexplored research opportunities. Our study intends to seize one of these opportunities and endeavor in a relatively original approach: a philosophically minded defense of economics as an interdisciplinary social science *within* a disciplinary framework. Grounded on BonJour's philosophy of science, our intention is to provide a rationale for economics to acknowledge the epistemological advantages of interdisciplinarity and open more space to its fellow social sciences.

4.3. LAURENCE BONJOUR'S COHERENTIST APPROACH TO PHILOSOPHY OF SCIENCE

Laurence BonJour's philosophy of science is not widespread in the economics literature. We conclude this from the modest seven results obtained in a search on WoS for citations to his *magnum opus*, *The Structure of Empirical Knowledge*, within the *Business & Economics* subject area.[24] Among these, Andrikopoulos (2015) uses philosophical theories of truth to assess the use of true values in finance. Cayla (2006) introduces the notion of coherence in the economics of organization. Corlett (1988) establishes the notion of alienation to argue that it exists in the American economy. Leppälä (2012) analyzes the incentives in knowledge transfer, relying on philosophical perspectives on justification. Rappaport (1988) defends an epistemological approach to economic methodology as a better link between economics and truth. Stevenson (1989) defends the role of reason in morals. And Yolles (2007), finally, develops a generic model of pathologies in social collectives in relation to coherence and complexity. Out of these, six papers make reference to BonJour once, while Cayla (2006) cites BonJour twice. None of them place BonJour's framework close to the core of their reasoning.

Naturally, as any philosophical system, coherentism has those who discredit it. A usual argument against coherentism, for example, is the one put forth by Grundmann (1999), which sees coherentism doomed to failure as it would fall back either on internalist regress or on foundationalism. We disagree with this claim. In fact, the reason why we adopt BonJour's approach is that inherent to any coherent system there is a notion of holism, that is, a notion that "the support of any claim is a matter of how well the claim is supported by everything else within the relevant system" (POSTON, 2014, p. 2). Hence, Poston (2014, p. 2) defends that

[24] Strictly speaking, some of these studies were published in *business* (Corlett (1988), Stevenson (1989), and Yolles (2007)) or in *finance* (Andrikopoulos (2015)), rather than in economics *per se*. Nevertheless, we kept them in the sample to ensure that the selection remained as faithful as possible to the WoS characterization.

justification is not foundational because specific claims demand a reason, and it does not result in infinite regress because such a holistic support does not depend upon an infinite number of non-repeating claims. Also, it is not circular because holism is not the same as circular arguments. Since our proposal is to establish a holistic approach to economics which does not disregard the neighboring social sciences in the construction of knowledge regarding social phenomena, we believe coherentism presents itself as an appropriate tool.

Furthermore, it is interesting to notice that BonJour (1997, p. 13-14) himself would come to find genuinely coherentist positions unattainable, after a great deal of criticism he had received. However, as we highlight, BonJour's system itself was not purely coherentist, inasmuch as it guaranteed a correspondence with reality. Nonetheless, despite the difficulty in attaining a coherentist grasp of reality, we hold the system to be appropriate to illustrate the kind of interdisciplinarity we advocate. Given the epistemological problem posed by the *Münchhausen trilemma* (ALBERT, 1985, p. 16-21) and the impossibility of actually *proving* any truth, BonJour's framework is here considered to be an effective means for *approaching* the true nature of social phenomena by means of a more interdisciplinary economics.

Therefore, section 4.3.1 offers some guidelines on coherentism. Section 4.3.2 appropriately presents BonJour's framework and the most important constructs he conceived in his aforementioned 1985 book. Later on, section 4.4 applies this framework to the statement advanced in section 4.2.1.

4.3.1. Coherence theories: truth versus justification

The genesis of the philosophical approach so-called *coherentism* is usually attributed to Harold Henry Joachim's 1906 essay, *The Nature of Truth*. In this work, Joachim (1906, p. 65) attempts to advance a view of truth as "systematic coherence." Accordingly, his essay represents an early draft of coherentism, which would later become an important approach to philosophy of science.

It is important to highlight, nonetheless, that what Joachim advances is a coherence theory of *truth*. One can, alternatively, defend a coherence theory of *justification*. The former, according to Young (2013, p. 1), dictates that "the truth of any (true) proposition consists in its coherence with some specified set of propositions." That is, coherence is both a necessary and a sufficient condition for asserting the veracity of a statement in a given belief system. A coherence theory of justification, on the other hand, holds that a belief is justified if and only if it coheres with a system of beliefs (OLSSON, 2017, p. 1). This means that a proposition, given

a certain system of beliefs, if coherent, is justified from the coherentist standpoint, but it does not mean that it necessarily corresponds to the truth.[25]

4.3.2. BonJour's coherentist theory of empirical justification

In this essay, we accommodate the latter, that is, a coherence theory of justification. More specifically, we make use of Laurence BonJour's coherentist approach to epistemic justification. This approach is presented in his book *The Structure of Empirical Knowledge*. BonJour's (1985, p. xi-xii) aim is to address the question surrounding the *justificatory structure of empirical knowledge* and to offer a dialectical alternative to foundationalism—avoiding pure coherentism as well. This section intends to offer a brief exposition of BonJour's framework.

BonJour (1985, p. 16-17) attacks foundationalism as the epistemological metatheory according to which some basic beliefs possess *a priori* and intrinsic epistemic justification and are the ultimate source of justification to entire systems of empirical knowledge. Pure coherentism, for BonJour (1985, p. 110), on the other hand, is unacceptable from the point of view that "a cognitive system which is to contain empirical knowledge must somehow receive input of some sort from the world." For BonJour, thence, the root of the problem that surrounds both approaches is the same: their permissiveness with the absence of correspondence between a given system of beliefs and independent reality. Therefrom, the American author anchors his coherentist framework in the necessity of a system of beliefs to bear empirical conformation. We organize his reasoning in three steps, which do not necessarily follow the order BonJour chose to expose his arguments.

First, we highlight BonJour's establishment of coherence—or whichever expression one find fit to express the idea of epistemological justification—as, and seemingly *having* to be, a basic constituent of virtually all epistemological theories, including the foundationalist ones. For that reason, he evades the task of providing a comprehensive definition of coherence. Recognizing that coherence as an epistemological tool falls short of the ideal, he simply proposes its preliminary definition as "a matter of how well a body of beliefs 'hangs together': how well its component beliefs fit together, agree or dovetail with each other, so as to produce an organized, tightly structured system of beliefs" (BONJOUR, 1985, p. 93). Here, coherence is not to be mistaken simply for logical consistency. It is a matter of mutual inferability of the

[25] For a comprehensive history of epistemic coherentism, see Poston (2014).

beliefs in a system (BONJOUR, 1985, p. 95). [26] This inferability, therefore, demands levels of coherence to be as high as possible.

However, there is no threshold degree of coherence to be pursued. It is a relative issue. A system of beliefs will be in epistemological advantage in relation to neighboring systems of beliefs if it finds itself with a higher degree of coherence than its rivals. The definition of the criteria to evaluate such a degree of coherence is the second step in our presentation of BonJour's philosophy of science. BonJour (1985, p. 95-99) establishes the relations of coherence in a belief system in proportion to five basic conditions. Accordingly, coherence (a) only exists if the system is logically consistent; (b) exists in proportion to the system's degree of probabilistic consistency; (c) increases the more inferential connections exist between the system's component beliefs and the stronger these connections are; (d) diminishes the more the system is divided into unconnected subsystems; and (e) decreases in proportion to the presence of unexplained anomalies in the system.

Among these, conditions (c), (d), and (e) are paramount for us and we return to them in the next section. For now, it suffices to highlight some straightforward implications arising from them. The first is that (c) and (d) are complementary. Together, the message they transmit is that, in order to have a coherent system of beliefs, one needs to have their system composed by strongly connected and mutually reinforcing beliefs. The second is that (e) is a byproduct of (c) and (d). Explanatory relations between the members of a system of beliefs enhances its coherence. Alternatively, if the beliefs in a system are strongly connected and mutually reinforcing, the system's correspondence with reality will be increased, and, accordingly, fewer events will escape its grasp: *if a system of beliefs is more capable of explaining the phenomena it is supposed to explain, and of predicting the phenomena it is supposed to predict, we can take as a corollary that fewer anomalies will surface*.

Moreover, the final step in the construction of BonJour's framework is that the author does not see any absurdity in linking a coherence theory of justification to a *correspondence* theory of truth (BONJOUR, 1985, p. 88). BonJour (1985, p. 4) understands truth here as postulated by the classical realist account, as a relation of correspondence, agreement, or accordance between belief and independent reality, something he considers indispensable to the endeavor of critical epistemology. Accordingly, epistemic justification acts as an attainable

[26] A system may be logically consistent and yet possess a low level of coherence. In this regard, probabilistic consistency is more suitable than logical consistency for two important respects. First, it is hard to imagine that a system will succeed in avoiding them completely. Second, it is a matter of degree, with reference to the number of conflicts contained in the system and in the degree of improbability involved in each case (BONJOUR, 1985, p. 95).

mediating link between the subjective input (belief) and the objective goal (truth), and its distinguishing characteristic is its exclusive commitment to the pursuit of truth. Even though the epistemic justification of a set of beliefs does not ensure its correspondence with truth, the appropriate choice of its standards renders reasonable the inference that a system of beliefs, at least in the long run, will tend to be true—or at least have its chances to be true increased (BONJOUR, 1985, p. 7-8). BonJour, therefore, advances the idea of a philosophical system in which the independent reality (truth) is more likely to be attained by means of a coherentist justification to cognitively spontaneous and observational beliefs, with the reliability of noninferential observations warranted by appeal to coherence from *within* a system of beliefs. This defines BonJour's system as a *coherentist theory of empirical justification*, in which the inputs are noninferential, observational, and cognitively spontaneous beliefs, conformed to systems of beliefs epistemically justified by means of inferential coherence, and whose ultimate goal is the understanding of the independent reality (BONJOUR, 1985, p. 113, 117-118). Furthermore, a coherentist account of observation, usually in reference to medium-sized physical objects, claims that "observational beliefs are epistemically justified or warranted only in virtue of background empirical knowledge which tells me that cognitively spontaneous beliefs of that specific sort are epistemically reliable […] under the conditions then satisfied." (BONJOUR, 1985, p. 122).

The social processes that concern us here, nonetheless, are not material and, therefore, are unobservable. For this unobservability to be overcome, BonJour (1985, p. 174, emphases added) defends that, it is required "the development of *theories*, descriptions of unobservable entities and processes which are postulated in the attempt to *explain* (and *predict*) the observable aspects of the world." This might allow the description of the aspects of the world that are open to observation and instigate the organization of a science that is both descriptively and prescriptively more accurate.

This is an especially important aspect of BonJour's methodological construction: theories must be able to *explain* and *predict* real phenomena. In the case of the social sciences, phenomena are often not the object of cognitively spontaneous beliefs. Theories, in this sense, must be built in order to approximate the sciences to the real nature of such phenomena, both in terms of prediction and in terms of explanation.

Accordingly, the elements that constitute BonJour's coherence theory of empirical justification assemble a powerful epistemological tool to be used in the defense of interdisciplinarity. The next section aims at applying this epistemological tool to justify the need for economics to be an interdisciplinary social science.

4.4. ECONOMICS AS AN INTERDISCIPLINARY SOCIAL SCIENCE FROM A COHERENTIST PERSPECTIVE

This section aims at presenting our defense of economics as an interdisciplinary social science. BonJour's epistemological apparatus is the paramount tool in this exercise. Thus, coherence is the comprehensive, all-encompassing factor in our analysis. Understood as mutual inferability within a belief system, the concept of coherence is crucial to the establishment of our analysis within a disciplinary scope. Without it, one might find hard to conceive disciplines as both intellectual categories and cultures. This is especially important if we consider—as we do—the social sciences as one big belief system, and the individual disciplines as its component subsystems. Nonetheless, we also need to resort to arguments advanced elsewhere.

The unit of analysis here is the answer to three fundamental questions in our recommended practice of economics as an interdisciplinary social science: (I) *why is interdisciplinarity important*; (II) *what is the purpose of interdisciplinary studies in economics*; and (III) *how interdisciplinarity should be put into practice*. Our reasoning presents these answers following this particular order.

Fundamental question (I) needs two steps to be answered. First, we must establish a coherentist argument for interdisciplinarity *vis-à-vis* multi- and transdisciplinarity, as we promised to do in section 2.1. Second, we must answer why economics should embrace it.

Dismissing multidisciplinarity is a relatively elementary task. Multidisciplinarity keeps disciplines apart, as objects are evaluated through several approaches. Multidisciplinarity is encyclopedic *per se*, and encyclopedic interdisciplinarity is at best a weak form of interdisciplinarity (BODEN, 1999, p. 14-15; KLEIN, 2010, p. 18). The approaches remain independent. BonJour's condition (d) for coherence establishes that the coherence of a system diminishes the more its subsystems are unconnected. It is hence straightforward that such procedure requires a very small—if not entirely inexistent—degree of coherence. Accordingly, one will find coherentist approaches unlikely to accommodate multidisciplinarity.

Dismissing transdisciplinarity, however, is fairly more intricate, and the argument here is likely to be less straightforward than the one presented to dismiss multidisciplinarity. Transdisciplinarity recommends the axiomatic unification of different disciplines. It seeks synthesis and unification instead of mutually reinforcing integration. The puzzle here emerges from the recognition that BonJour's conditions (c) and (d) taken together, in the limit, approximate ideal coherence to the ideal of a unified science. Strictly speaking, and even though

this result is not a *sine qua non* condition for coherence, a unified science would indeed carry a higher level of coherence *per se* and BonJour establishes that something in this general direction *may* be required. The ideal of a unified science, nevertheless, demands that "the laws and terms of various disparate disciplines are reduced to those of some single master discipline" (BONJOUR, 1985, p. 97). In this scenario, beliefs would be serially ordered as to regress, in the limit, to the laws and terms of a master discipline.

At first glance, a pragmatic argument for dismissing transdisciplinarity is the perception that we are so far away from this ideal in the social sciences that even aiming at it is not worth the effort. Throughout the history of the social sciences, noteworthy individuals have invested their minds in this project, finding little or no success in their unification ventures. Auguste Comte, for example, addressed this objective, placing sociology as the master social discipline (ACTON, 1951, p. 305; DAWSON, 1954, p. 124), while Karl Marx wanted to achieve this goal through the suppression of social science by socialist economics (COHEN, 1972, p. 196). Their ineffectiveness on this matter is not detailed here, but the mere fact that not even Comte and Marx were successful in this task is illuminating. In addition, the Harvard historian, sociologist, and theologian Christopher Dawson (1954, p. 124), writes that a hundred years after Comte's advent of sociology as keystone of man's intellectual achievement, there was little prospect of the attainment of this ideal. More than sixty years after Dawson's article, the history of the social sciences shows us that this perception still holds.

Choosing interdisciplinarity over transdisciplinarity demands that there is no ultimate relation of epistemic priority between members of a belief system. Given that the social sciences are assumed to be a belief system, and the individual sciences are assumed to be its subsystems, our reasoning cannot accommodate a unified social science to which all individual social sciences are reduced.[27] Following Gunn (1992, p. 255), we believe the future of interdisciplinary studies to depend on the scientists' readiness to resist the temptation to take the methods and theories of one discipline as sufficient to interpret the materials of many.

Furthermore, we may derive an additional argument against transdisciplinarity from the concept of emergence.[28] Lawson (1997, p. 172) defines an entity and its properties as emergent

[27] This is precisely what those who defend economics as *queen of the social sciences* advocate: that all social reasoning should be reduced—or pay tribute—to economics. Examples of such advocates are Lazear (2000) and Stigler (1984). For more on the topic, see Backhouse and Fontaine (2010, p. 11) and Lerner (1972, p. 259). A product of this attitude is what has been commonly regarded as *economics imperialism*, which represents "a form of economics expansionism where the new types of explanandum phenomena are located in territories that are occupied by disciplines other than economics" (MÄKI, 2009, p. 360). For more on this latter subject, see Mäki (2009) and Rolin (2018).

[28] For a history of the emergence concept from Hegel to chaos theory and its relation with the social sciences, see Hodgson (2000).

"if there is a sense in which it has arisen out of some 'lower' level, being conditioned by and dependent upon, but not predictable from, the properties found at the lower level." Internally related structures, accordingly, arise at their own levels and the whole is not merely the sum of its constituent parts. In our account, the social sciences system is believed to have inalienable emergent properties. As such, the simple unification of the social sciences would not have as much epistemological power as the interdisciplinary integration of autonomous disciplines, because the latter would keep the emergent properties of particular sciences unaltered. Our concern is organization rather than aggregation, and higher levels cannot be simply represented by the laws ruling their isolated particulars (LAWSON, 1997, p. 126; MORGAN, 1933, p. 58; POLANYI, 1966, p. 36). Therefore, we believe interdisciplinarity, the intermediate approach between multi- and transdisciplinarity, to be the most powerful one: it integrates disciplines in a proactive manner, keeping in mind that disciplinary beliefs are epistemically equivalent and that organizing structures matter.

Intrinsic to this belief, there is the notion of scientific *boundaries*. That is, since we are defending that the sciences must remain existing independently, we are defending that disciplinary boundaries must be to some degree respected. The disciplinary boundaries are fundamental to our analysis precisely because we do not intend to take coherence to its supposedly final consequences. According to Winston (1988, p. 2), boundaries are important to define and differentiate certain disciplinary inquiries from the ones of other disciplines. The material field of the social sciences is societal behavior in its multiple levels, but we maintain that each discipline should hold to its particular focal point—or characteristic subject matter—, and, ergo, respect its boundaries.[29] It is important to preserve the differing standpoints, because each group of social scientists presents a characteristic *Weltanschauung*—"mental set with which the scientist [or a group of scientists], either consciously or unconsciously, begins his [their] investigations" (GRUCHY, 1947, p. 10)—, which is to be preserved and nurtured.

Given these arguments to defend interdisciplinarity rather than trans- or multidisciplinarity, the remaining of the answer to fundamental question (I) is concentrated on the reasons why economics should actually put interdisciplinarity in practice. These reasons are twofold. First, economics is a discipline that belongs to the realm of the social sciences. This means that economics may be understood as a subsystem of the social sciences system.

[29] Heckhausen (1972, p. 83-84) defines the material field of a discipline as "the set of objects in an understanding on the common sense level." On this criterion, various disciplines overlap enormously, and this appears to be the main cause of interdisciplinarity as a "highly valued fad." The subject matter of a discipline, on the other hand, is "the point of view from which a discipline looks upon the material field cuts" given the possible sets of observables. It is, accordingly, a more refined concept for disciplinary *object*.

Accordingly, the understanding of the economic aspects of the world itself ought to profit from a higher level of integration between the individual disciplines. Therefore, from a coherentist standpoint, the more economics develops its inferential relations with the other social sciences, the more explanatory relations will be established. To put it in another way, BonJour's conditions (c) and (d) for coherence define that the coherence of a system is strengthened when its component beliefs develop steady reciprocal explanatory connections. Hence, the more economics develops its inferential relations with the other social sciences, the more the coherence of the system will be increased. Both explanation and prediction will be reinforced. This is a corollary of BonJour's conditions (c) and (d).

Another corollary of conditions (c) and (d) is BonJour's condition (e), which establishes a system's degree of coherence as negatively correlated with the presence of unexplained anomalies. If the search for knowledge outside the boundaries of economics yields more explanatory power to the discipline, it is straightforward that fewer anomalies will have space to surface. The epistemological difference here is that, while conditions (c) and (d) are subsumed to fundamental question (I), condition (e) encloses the answer to fundamental question (II).

We understand scientific anomalies here following Caporaso (1995) and Star and Gerson (1986). Caporaso (1995, p. 458) establishes that "anomalies are those outcomes which go against the grain. They are not what our prevailing intuitions and theories would have us believe." Star and Gerson (1986, p. 148), in addition, postulate that anomalies are circumscribed both to a specific disciplinary set of beliefs and to a specific institutional context.

In this sense, interdisciplinarity is perhaps the strongest alternative to mitigate the appearance of unexplained anomalies. Consequently, it is the answer to fundamental question (II): *the purpose of interdisciplinary studies in economics is the reduction of unexplained anomalies in economic reasoning*. The way to reduce the number of potential anomalies, we propose, is to challenge and remodel the epistemological structure of economic knowledge into the empirically conformed one of an interdisciplinary social science. Phenomena unfamiliar to economics' hypotheses and reasoning may be commonplace in other disciplines. Ergo, if economists are sufficiently open-minded as to look for answers to unexplained phenomena outside their science, and towards the observations and considerations of fellow social scientists, economics is likely to find itself dealing with fewer unexplained events. In this design, economics should be interested in interdisciplinarity precisely because it could both reformulate economics' implicit assumptions and incorporate new assumptions from the neighboring disciplines. In line with the Social Science Research Council's view Millis,

Johnson, and Barnett (1931, p. 286) reported to the American Economic Association, economic reasoning alone cannot cover all the issues arising from the social problems circumscribed to the discipline. Accordingly, social science interdisciplinarity ought to improve economics' correspondence with reality and fill in the theoretical gaps that would otherwise be filled by unexplained anomalies. In this sense, social science interdisciplinarity might also render economics—and, as a matter of fact, all the sciences whose ontological roots are essentially social—more coherent, more robust, less prone to anomalies, and much closer to apprehending the truth of the independent social world.

Fundamental question (III), that is, *how interdisciplinarity should be put into practice*, however, is yet to be answered. This answer is the recommendation of the way we judge the status of economics as an interdisciplinary social science to be more thoroughly achievable. Three are the attributes of this answer: integration, supplementation, and the adoption of a critical attitude.

Integration and interaction are the usual benchmarks for interdisciplinarity (KLEIN, 2010, p. 17; LATTUCA, 2001, p. 78). Accordingly, economics should be integrated with the other social sciences in the sense that the theoretical constructs of these disciplines contribute both to the solution of economic problems and the formulation of economic theories. This interdisciplinary activity might be distinguished between issues related with general education, professional training, research training, and research practice (BERGER, 1972, p. 42). The integrated design defended here for economics aims at building bridges[30] between the social sciences in all these ventures, that is, education, professional activity, and research practice, because, as Engerman (2015, p. 79) postulates, "interdisciplinary enterprises produce not just new forms of knowledge, […] but broader students and better-trained specialists." For that reason, we believe economics would be in a more advantageous epistemological situation if it gave more space to the social sciences in its undergraduate and graduate curricula, economists considered the social sciences in the resolution of actual professional problems, and the publications in economics opened more space to research that intertwine economics and its sister social disciplines.

The integration of economics with its fellow social sciences should also be supplementary as to increase the sophistication in the exchange of methods and concepts as a mechanism to foster mutual interdependence (KLEIN, 2010, p. 19). Heckhausen (1972, p. 88-89) established this as one of six types of interdisciplinarity. It is the last step before what he

[30] The building bridges metaphor is important because, unlike restructuring, it necessarily involves two or more complete, firm, autonomous disciplines—as is the case for the social sciences (KLEIN, 2010, p. 21).

called *unifying* interdisciplinarity—which very much resembles transdisciplinarity. It requires disciplines from the same material field to have correspondent levels of theoretical integration—i.e., approximately the same levels of scientific maturity—as we believe to be the case for the social sciences. This correspondence is sought to reconstruct social processes more fully.

Finally, interdisciplinarity ought to be critical *vis-à-vis* the need for it to question the dominant structures of knowledge and education, explicitly aiming at remodeling them. This requires economists to adopt a political position towards interdisciplinarity that challenges the current structure of economic knowledge, demanding interdisciplinarity to acknowledge the shortages and issues of oppressed and marginalized groups. Challenging this structure, however, does not mean that disciplinary boundaries should be transformed into something else entirely: it comprehends accommodation within the existing structure (KLEIN, 2010, p. 23). In Gunn's words (1992, p. 249), the result, if not the purpose, of these efforts "is to dispute and disorder conventional understandings of the relations between such things as origin and terminus, center and periphery, focus and margin, inside and outside." In line with this, what our approach defends is *accommodation* rather than *substitution*, *disturbance* rather than *disruption*, and *reform* rather than *revolution*.

4.5. CONCLUDING REMARKS

This essay defended that correspondence between economic theories and the independent reality must exist. Economics must cover more possibilities, insofar as it must be able to fairly *predict* and *explain* the social phenomena it is intended to. In this sense, we contended that resorting to the social sciences—those disciplines whose material field is the same as economics—is a crucial step. From Gunn (1992, p. 241, 251), we may understand that interdisciplinarity might allow economics to represent its own knowledge to itself in new forms, altering the way economists think about the very economic thinking.

We relied on BonJour's coherentism, presented in section 3, to defend why the insularity of economics inhibits a more thorough understanding of the social processes. Through his approach to philosophy of science, a coherence theory of epistemic justification could—and, more importantly, should—be combined with a correspondence theory of truth to form a *coherence theory of empirical justification*, whose purpose would be the approximation of scientific theories to the independent reality of its subject matter. Therefore, *economics*, *recognizing the epistemic advantages of interdisciplinary knowledge,* should *challenge and*

remodel the epistemological structure of economic reasoning, by means of an enduring integration of its methods and theories with those of the other social sciences.

This task, if successfully executed, does not amount to saying that economics' correspondence with reality will eventually become flawless. Following Winston (1988, p. 10), "It is simply uninteresting that economics is an imperfect 'science'—it exists in an imperfect world and confronts issues of mind-boggling complexity. What matters is that economics understanding be improved, not that it aspire to perfection."

5. CONCLUDING REMARKS

This dissertation organized three essays taking the interdisciplinarity between economics and its fellow social sciences as the common thread. As posed earlier, these essays offered manifold perspectives on the relation of interdisciplinarity economics maintains with the neighboring social sciences.

The first essay surveyed the economics literature relating the discipline with the other social sciences from manifold perspectives. From a preliminary search on the Scopus database and a subsequent filter through the abstract of each work, our selection counted with 236 research works. The survey showed that the discipline holds a wide scope of topics discussed in an interdisciplinary fashion, which range from interdisciplinary case studies to normative recommendations for the interdisciplinary practice of economics. These studies are spread among a great number of journals—among which we do not find the most prestigious economics journals—and among a narrow number of book publishers.

In order to produce further information on these bibliographical relations, the second essay performed a bibliometric exercise comparing the presence of each social science within the social sciences network. The main conclusion of this essay, parsimoniously put, establishes that, if we rely on the American associations' flagship journals as proxies for entire disciplines, understand journal articles as the main sources of knowledge diffusion, and count the best-ranked journals as more pervasive influences, we could say that, from 1959 to 2018, economics has become both a more interdisciplinary social science and the most important discipline within the social sciences interdisciplinary network. Notwithstanding these results, it is imperative to notice that economics' openness to its fellow social sciences remains considerably below the average interdisciplinarity within the social sciences network. Especially, economics pays much less tribute to theories and methods germane to the neighboring social sciences than do political science and sociology.

The third essay, at last, given the conclusion of the previous essays, established a philosophically minded, normative defense of economics as an interdisciplinary social science. Through Laurence BonJour's coherentism, it defended that economics should be more mindful of the other social sciences. We contended this to be an effective way to fairly predict and explain the social phenomena concerning economics. Therefore, *economics*, *recognizing the epistemic advantages of interdisciplinary knowledge,* should *challenge and remodel the epistemological structure of economic reasoning, by means of an enduring integration of its methods and theories with those of the other social sciences*.

Furthermore, from these essays, we may understand that the social sciences are not absent from the economics literature. They are indeed present, their role permeates a considerable number of subjects, and this presence has become more intense across time. Nevertheless, the essays also illustrate the fact that economics is far from being as mindful of the neighboring social sciences as it could be. As such, we believe economics should resort to its fellow social sciences more often than it does as a means to improve its epistemological capacity to explain and predict the social phenomena which concerns economics. Providing reasonable explanations and predictions regarding these social phenomena is the very raison d'être of economic thinking. Accordingly, assuming the cohesive treatment of such social phenomena is the goal of the economist, we believe he/she should not spare efforts in this direction.

6. REFERENCES

ABBOTT, A. **Chaos of disciplines**. Chicago and London: The University of Chicago Press, 2001.

ACTON, H. Comte's positivism and the science of society. **Philosophy**, 26(99); 291-310, 1951.

AHRENS, J.; HOEN, H. W. **Institutional reform in Central Asia**: Politico-economic challenges. London and New York: Routledge, 2012.

AKERLOF, G. Behavioral macroeconomics and macroeconomic behavior. **The American Economic Review**, 92(3): 411-433, 2002.

ALBERT, H. **Treatise on critical reason**. Princeton: Princeton University Press, 1985.

ALMEIDA, F. Society and brain: A complementary approach to Thorstein Veblen's conspicuous consumer based on Tibor Scitovsky's neuropsychology. **Nova Economia**, 26(2): 347–367, 2016.

ALMEIDA, F.; ANGELI, E.; PONTES, R. An institutional explanation for economists' theoretical and methodological choices. **Review of Political Economy**, 29(1): 80-92, 2017.

AMBROSINO, A. A cognitive approach to law and economics: Hayek's Legacy. **Journal of Economic Issues**, 48(1): 19–48, 2014.

ANDRIKOPOULOS, A. Truth and financial economics: a review and assessment. **International Review of Financial Analysis**, 39(1): 186-195, 2015.

ANGRIST, J.; AZOULAY, P.; ELLISON, G.; HILL, R.; LU, S. Inside job or deep impact? Using extramural citations to assess economic scholarship. **NBER Working Papers**, n. 23698, August 2017.

APPIGNANESI, L. Theoretical Conversation and Conceptual Transplants between Economics and Systems Theory: Towards an Interpretative Passe-partout of Functional Systems. **Journal of Interdisciplinary Economics**, 29(1): 67–81, 2017.

ARIA, M.; CUCCURULLO, C. bibliometrix: An R-tool for comprehensive science mapping analysis. **Journal of Informetrics**, 11(4): 959-975, 2017.

AROCENA, P.; VILLANUEVA, M. Access as a motivational device: Implications for human resource management. **Kyklos**, 56(2): 199–222, 2003.

AUGIER, M.; MARCH, J. G. A model scholar: Herbert A. Simon (1916-2001). **Journal of Economic Behavior and Organization**, 49(1): 1–17, 2002.

BACHEV, H. Mechanisms of governance of sustainble development. **Journal of Applied Economic Sciences**, 4(2): 169–184, 2009.

BACHEV, H. Management strategies for conservation of natural resources in agriculture. **Journal of Advanced Research in Law and Economics**, 4(1): 4–45, 2013.

BACHEV, H. Defining and assessing the governance of agrarian sustainability. **Journal of Advanced Research in Law and Economics**, 7(4): 797–816, 2016.

BACKHAUS, J. G. Comment on Roger Cotterrell "Sociological interpretations of legal development". **European Journal of Law and Economics**, 2(4): 361–364, 1995.

BACKHOUSE, R.; CHERRIER, B. The age of the applied economics: the transformation of economics since the 1970s. 49(Supplement): 1-33, 2017.

BACKHOUSE, R.; FONTAINE, P. Introduction: history of economics as history of social science. History of Political Economy, 42(Supplement): 1-21, 2010.

BACKHOUSE, R.; FONTAINE, P. Economics and other social sciences: A historical perspective. **Annals of the Fondazione Luigi Einaudi**, 52(2): 7–44, 2018.

BACKHOUSE, R.; MEDEMA, S. Retrospectives: on the definition of economics. **Journal of Economic Perspectives**, 23(1): 221-233, 2009.

BARDY, R.; DREW, S.; KENNEDY, T. F. Foreign Investment and Ethics: How to Contribute to Social Responsibility by Doing Business in Less-Developed Countries. **Journal of Business Ethics**, 106(3): 267–282, 2012.

BARRY, A.; BORN, G.; WESZKALNYS, G. Logics of interdisciplinarity. **Economy and Society**, 37(1): 20–49, 2008.

BEARD, J. **The political economy of desire**: international law, development and the nation state. Abingdon: Routledge-Cavendish, 2006.

BECKMANN, V.; PADMANABHAN, M. **Institutions and sustainability**: political economy of agriculture and the environment-Essays in honour of Konrad Hagedorn. London: Springer, 2009.

BEKAERT, G.; HARVEY, C. R. Research in emerging markets finance: Looking to the future. **Emerging Markets Review**, 3(4): 429–448, 2002.

BENEDIKTER, R.; SIEPMANN, K. Introduction. IN: BENEDIKTER, R.; SIEPMANN, K. **Chile in transition**: prospects and challenges for Latin America's forerunner of development. London: Springer, 2015.

BERETTA, S.; MAGGIONI, M. A. "The whole breadth of reason": A step towards rethinking economics and rationality. **Rivista Internazionale di Scienze Sociali**, (3): 241–262, 2012.

BERGER, G.; APOSTEL, L.; BRIGGS, A.; MICHAUD, G. **Interdisciplinarity**: problems of teaching and research in universities. Nice: Organization for Economic Cooperation and Development, 1972.

BERNITZ, U.; MÅRTENSSON, M.; OXELHEIM, L.; PERSSON, T. **Bridging the prosperity gap in the EU**: the social challenge ahead. Cheltenham: Edward Elgar, 2018.

BERTACCHINI, E.; BRAVO, G.; MARRELLI, M.; SANTAGATA, W. **Cultural commons**: a new perspective on the production and evolution of cultures. Cheltenham: Edward Elgar, 2012.

BIDDLE, J.; HAMERMESH, D. Theory and measurement: emergence, consolidation, and erosion of a consensus. **History of Political Economy**, 49(Supplement): 34-57, 2017.

BIGO, V.; NEGRU, I. Theorising care: a possible defence of interdisciplinary in economics. **International Journal of Green Economics**, 5(2): 109-125, 2011.

BIRNBACHER, D.; THORSETH, M. **The politics of sustainability**: philosophical perspectives. London and New York: Routledge, 2015.

BIRNER, R.; BRÄUER, I.; GRETHE, H.; HIRSCHFIELD, J.; LÜTH, M.; MEYER, J.; WÄLZHOLZ, A.; WENK, R.; WITTMER, H. I buy, therefore I want? - An interdisciplinary, analysis of the consumer decision to buy or not to buy food commodities that are produced in a particularly environment- and animal-friendly way. **Berichte uber Landwirtschaft**, 80(4): 590–613, 2003.

BOCHKO, V. S. Regions' economic autonomy in the new reality. **Economy of Region**, (2): 342–358, 2016.

BODEN, M. What is interdisciplinarity? IN: CUNNINGHAM, R. **Interdisciplinarity and the organization of knowledge in Europe**. Luxembourg: Office for Official Publications of the European Communities, 1999.

BÖGENHOLD, D. Schumpeter's Idea of a Universal Social Science. **Atlantic Economic Journal**, 42(2): 205–215, 2014.

BÖGENHOLD, D. The order of social sciences: sociology in dialogue with neighbouring disciplines. **The Journal of Philosophical Economics**, 11(1): 27-52, 2017.

BÖGENHOLD, D. Economics between insulation and social-scienciation: Observations by a Sociology of Economics. **Journal of Economic Issues**, 52(4): 1125–1142, 2018.

BOLSHAKOV, N. V. Bring together, combine and mix: Qualitative and quantitative methods in modern research practices. **Monitoring Obshchestvennogo Mneniya: Ekonomicheskie i Sotsial'nye Peremeny**, 3(139): 21–29, 2017.

BONDREA, A; MIHOREANU, L.; COSTEA, C.; VASILE, A. Emerging from crisis with new approaches to science of society. **World Review of Entrepreneurship, Management and Sustainable Development**, 11(2–3): 172–185, 2015.

BONJOUR, L. **The structure of empirical knowledge**. Cambridge: Harvard University Press, 1985.

BONJOUR, L. Haack on justification and experience. **Synthese**, 112(1): 13-23, 1997.

BOULDING, K. Samuelson's Foundations: the role of mathematics in economics. **Journal of Political Economy**, 56(3): 187-199, 1948.

BOURDIEU, P. **Distinction**: a social critique of the judgement of taste. Cambridge: Harvard University Press, 1984.

BOWLES, D. H.; STURGEON, J.; ARDEBILI, M.; PINKHAM, K.; WASHER, W.; JUMARA, J.; BRAZELTON, W.; ERICKSON, K.; ATOWNSEND, J.; BERKSHIRE, E.; CORN, P.; JOHNSON, J.; NADOLSKI, D.; TAUHEED, L. Interdisciplinary social science, global social theory, and socio-economics: a report on the UMKC Symposium at the Vienna Conference. **Journal of Socio-Economics**, 28(4): 387–427, 1999.

BRAHAM, M.; STEFFEN, F. **Power, freedom, and voting**. London: Springer, 2008.

BRIGHETTI, G.; LUCARELLI, C.; MARINELLI, N. Do emotions affect insurance demand? **Review of Behavioral Finance**, 6(2): 136–154, 2014.

BROGAARD, J.; ENGELBERG, J.; PARSONS, C. Networks and productivity: causal evidence from editor rotations. **Journal of Financial Economics**, 111(1): 251-270, 2014.

BROUSSEAU, E.; GLACHANT, J.-M. **The manufacturing of markets**: legal, political and economic dynamics. Cambridge: Cambridge University Press, 2013.

BROWN, V. **The Adam Smith review**: Volume 3. London and New York: Routledge, 2007.

BROWN, V.; FLEISCHACKER, S. **The philosophy of Adam Smith**: the Adam Smith review: Volume 5. London and New York: Routledge, 2010.

BRUNI, L.; SENA, B. **The charismatic principle in social life**. London and New York: Routledge, 2012.

BRZEZICKA, J.; WISNIEWSKI, R. Homo Oeconomicus and behavioral economics. **Contemporary Economics**, 8(4): 353–364, 2014.

CAILLÉ, A. From the social sciences to one social science. Anti-utilitarian foundations. **Annals of the Fondazione Luigi Einaudi**, 52(2): 69–93, 2018.

CALOFFI, A.; LAZZERETTI, L.; SEDITA, S. R. The story of cluster as a cross-boundary concept: From local development to management studies. **Advances in Spatial Science**, 8: 123–137, 2018.

CAPORASO, J. Research design, falsification, and the qualitative-quantitative divide. **American Political Science Review**, 89(2): 457-460, 1995.

CARTES, D. Energy systems, economics, and sustainability. **Research in Experimental Economics**, 14: 213–222, 2011.

CASSIS, Y.; WÓJCIK, D. **International financial centres after the Global Financial Crisis and Brexit**. Oxford: Oxford University Press, 2018.

CAVALIERI, M. Inside institutions of Progressive-Era social sciences: The Interdisciplinarity of Economics and Sociology. **Journal of Economic Issues**, 50(2): 345–361, 2016.

CAYLA, D. Ex post and ex ante coordination: principles of coherence in organization and markets. **Journal of Economic Issues**, 40(2): 325-332, 2006.

CEDRINI, M.; FONTANA, M. Just another niche in the wall? How specialization is changing the face of mainstream economics. **Cambridge Journal of Economics**, 42(2): 427-451, 2017.

CEDRINI, M.; MARCHIONATTI, R. On the Theoretical and Practical Relevance of the Concept of Gift to the Development of a Non-imperialist Economics. **Review of Radical Political Economics**, 49(4): 633–649, 2017.

CHAFIM, F. Disciplinary division within social sciences: Methodological issues in economic imperialism & economic pluralism. **History of Economic Ideas**, 24(3): 145–164, 2016.

CHEN, Y.; XIE, L. China's social science research on climate change and global environmental change. IN: WHALLEY, J. **World scientific reference on Asia and the world economy**. New Jersey: World Scientific, 2015.

CHERRIER, B.; SVORENCIK, A. The quantitative turn in the history of economics: promises, perils and challenges. **Journal of Economic Methodology**, 25(4): 367-377, 2018.

CHRISTOFOROU, A.; DAVIS, J. B. **Social capital and economics**: social values, power, and social identity. London and New York: Routledge, 2014.

CHRISTOFOROU, A.; LAINÉ, M. **Re-thinking economics**: exploring the work of Pierre Bourdieu. London and New York: Routledge, 2014.

CLAVEAU, F.; GINGRAS, Y. Macrodynamics of economics: a bibliometric history. **History of Political Economy**, 48(4): 551-592, 2016.

CLAVEAU, F.; HERFELD, C. Network analysis in the history of economics. **History of Political Economy**, 50(3): 597-603, 2018.

COATS, A. W. The American Economic Association and the economics profession. **Journal of Economic Literature**, 23(4): 1967-1727, 1985.

COHEN, G. Karl Marx and the withering away of social science. **Philosophy & Public Affairs**, 1(2): 182-203, 1972.

COLUSSI, T. Social ties in academia: a friend is a treasure. **Review of Economics and Statistics**, 100(1): 45-50, 2018.

COMIM, F. Preface. IN: COMIM, F.; NUSSBAUM, M. **Capabilities, gender, equality**: towards fundamental entitlements. Cambridge: Cambridge University Press, 2012.

CONROY, M.; DUSANSKY, R.; DRUKKER, D.; KILDEGAARD, A. The productivity of economics departments in the U.S.: publications in the core journals. **Journal of Economic Literature**, 33(4): 1966-1971, 1995.

CORLETT, J. Alienation in capitalist society. **Journal of Business Ethics**, 7(9): 699-701, 1988.

CORSI, M. Thinking of Sylos Labini (or Sylos Labini's thinking). **Review of Political Economy**, 19(4): 555–562, 2007.

COUPÉ, T. Revealed performances: worldwide rankings of economists and economics departments, 1990-2000. **Journal of the European Economic Association**, 1(6): 1309-1345, 2003.

COUTINHO, D. R. Direito e institucionalismo econômico: Apontamentos sobre uma fértil agenda de pesquisa. **Revista de Economia Politica**, 37(3): 565–586, 2017.

COYNE, C. J.; MATHERS, R. L. **The handbook on the political economy of war**. Cheltenham: Edward Elgar, 2011.

COYNE, C. J.; MATHERS, R. L. **Rituals**: an economic interpretation. Journal of Economic Behavior and Organization, 78(1–2): 74–84, 2011b.

CRUZ-SACO, M. A.; ZELENEV, S. **Intergenerational solidarity**: strengthening economic and social ties. Houndmills: Palgrave Macmillan, 2010.

DASKALAKIS, M. Specification required? A survey of scientists' views about the role of behavioral economics for assessing environmental policy instruments. IN: **New perspectives for environmental policies through behavioral economics**. London: Springer, 2015.

DAVIS, A. Global Production Networks and the Private Organization of World Trade. **Journal of Economic Issues**, 52(2): 358–367, 2018.

DAVIS, J. Mäki on economics imperialism. IN: LEHTINEN, A.; KUORIKOSKI, J.; YLIKOSKI, P. **Economics for real**: Uskali Mäki and the place of truth in economics. London: Routledge, 2013.

DAVIS, J. B. Economics imperialism versus multidisciplinarity. **History of Economic Ideas**, 24(3): 77–94, 2016.

DAWSON, C. Sociology as a science. **CrossCurrents**, 4(2): 124-137, 1954.

DEKKER, E.; TEULE, P. Economics made fun, and made fun of: how "fun" redefines the domain and identity of the economics profession. **Journal of Economic Methodology**, 19(4): 427–437, 2012.

DIETZ, R. D.; HAURIN, D. R. The social and private micro-level consequences of homeownership. **Journal of Urban Economics**, 54(3): 401–450, 2003.

DIETZ, S.; MICHIE, J.; OUGHTON, C. **The political economy of the environment**: an interdisciplinary approach. London and New York: Routledge, 2011.

DOLFSMA, W.; KESTING, S. **Interdisciplinary economics**: Kenneth E. Boulding's engagement in the sciences. London and New York: Routledge, 2013.

DOW, S. Policy in the wake of the banking crisis: Taking pluralism seriously. **International Review of Applied Economics**, 26(2): 161–175, 2012.

DOWNWARD, P.; MEARMAN, A. Retroduction as mixed-methods triangulation in economic research: reorienting economics into social science. **Cambridge Journal of Economics**, 31(1): 77–99, 2007.

DUARTE, P.; GIRAUD, Y. The place of the history of economic thought in mainstream economics, 1991-2011, viewed through a bibliographic survey. **Journal of the History of Economic Thought**, 38(4): 431-462, 2016.

EDWARDS, J.; GIRAUD, Y.; SCHINCKUS, C. A quantitative turn in the historiography of economics? **Journal of Economic Methodology**, 25(4): 283-290, 2018.

EFENDIC, A.; BABIC, B.; REBMANN, A. **Social capital, migration, ethnic diversity and economic performance**: multidisciplinary evidence from South-East Europe. Bern: Peter Lang AG, 2017.

EMMETT, R. B. Specializing in interdisciplinarity: the committee on social thought as the University of Chicago's antidote to compartmentalization in the social sciences. **History of Political Economy**, 42(Supplement): 261–287, 2010.

ENDERS, J. C.; REMIG, M. **Theories of sustainable development**. London and New York: Routledge, 2014.

ENGERMAN, D. The pedagogical purposes of interdisciplinary social science: a view from area studies in the United States. **Journal of the History of the Behavioral Sciences**, 51(1): 78-92, 2015.

ERJAVEC, E.; LOVEC, M. Research of European Union's Common Agricultural Policy: disciplinary boundaries and beyond. **European Review of Agricultural Economics**, 44(4): 732–754, 2017.

FALGUERAS-SORAUREN, I. The convoluted influence of Robbins's thinking on the emergence of Economics Imperialism. **Cambridge Journal of Economics**, 42(5): 1473–1494, 2018.

FARRAR, J. H.; MAYES, D. G. **Globalisation, the Global Financial Crisis and the State**. Cheltenham: Edward Elgar, 2013.

FESTRÉ, A.; GARROUSTE, P. Theory and evidence in psychology and economics about motivation crowding out: A possible convergence? **Journal of Economic Surveys**, 29(2): 339–356, 2015.

FETCHENHAUER, D.; AZAR, O.; ANTONIDES, G.; DUNNING, D.; FRANK, R.; LEA, S.; ÖLANDER, F. Monozygotic twins or unrelated stepchildren? On the relationship between economic psychology and behavioral economics. **Journal of Economic Psychology**, 33(3): 695–699, 2012.

FINE, B. A question of economics: Is it colonizing the social sciences? **Economy and Society**, 28(3): 403–425, 1999.

FINE, B. Economics imperialism and the new development economics as Kuhnian Paradigm shift? **World Development**, 30(12): 2057–2070, 2002.

FINE, B. Callonistics: a disentanglement. **Economy and Society**, 32(3): 478–484, 2003.

FINE, B. Economics imperialism as Kuhnian revolution? IN: ARESTIS, P.; SAWYER, M. **The rise of the market**: critical essays on the political economy of neo-liberalism. Cheltenham: Edward Elgar, 2004.

FINE, B. Vicissitudes of economics imperialism. **Review of Social Economy**, 66(2): 235-240, 2008.

FINE, B. The economics of identity and the identity of economics? **Cambridge Journal of Economics**, 33(2): 175–191, 2009.

FINE, B.; MILONAKIS, D. **From Economics Imperialism to Freakonomics**: the Shifting Boundaries between Economics and other Social Sciences. London and New York: Routledge, 2009.

FINE, B.; MILONAKIS, D. From freakonomics to political economy. **Historical Materialism**, 20(3): 81–96, 2012.

FONTAINE, P. Introduction: the social sciences in a cross-disciplinary age. **Journal of the History of the Behavioral Sciences**, 51(1): 1-9, 2015

FORMAN, F. **The Adam Smith review**: Volume 9. London and New York: Routledge, 2016.

FORSTATER, M. How the AJES got its mission statement in 1941 Adolph Lowe's plea for cooperation and constructive synthesis in the social sciences. **American Journal of Economics and Sociology**, 61(4): 779–786, 2002.

FORTE, F.; MUDAMBI, R.; NAVARRA, P. M. **A handbook of alternative theories of public economics**. Cheltenham: Edward Elgar, 2014.

FOURCADE; M.; OLLION, E.; ALGAN, Y. The superiority of economists. **Journal of Economic Perspectives**, 29(1), pp. 89-114, 2015.

FRODEMAN, R.; KLEIN, J. T.; MITCHAM C. **The Oxford handbook of interdisciplinarity**. Oxford: Oxford University Press, 2010.

FU, J. **Institutions and investments**: foreign direct investment in china during an era of reforms. Ann Arbor: The University of Michigan Press, 2010.

GANSSMANN, H. **New approaches to monetary theory**: interdisciplinary perspectives. London and New York: Routledge, 2012.

GARFIELD, E. The evolution of the Science Citation Index. **International Microbiology**, 10(1): 65-69, 2007.

GARTLAND, M. P. Interdisciplinary views of sub-optimal outcomes: Path dependence in the social and management sciences. **Journal of Socio-Economics**, 34(5): 686–702, 2005.

GAZZOLA, M.; TEMPLIN, T.; WICKSTRÖM, B.-A. **Language policy and linguistic justice**: economic, philosophical and sociolinguistic approaches. London: Springer, 2018.

GIBSON, C. C.; OSTROM, E.; AHN, T. K. The concept of scale and the human dimensions of global change: a survey. **Ecological Economics**, 32(2): 217–239, 2000.

GIULIANI, E.; MACCHI, C. Multinational corporations' economic and human rights impacts on developing countries: a review and research agenda. **Cambridge Journal of Economics**, 38(2): 479–517, 2014.

GOORHA, P. Policy in the knowledge economy social network: a social capital redux. **International Journal of Social Economics**, 36(9): 930–944, 2009.

GREENGLASS, E.; ANTONIDES, G.; CHRISTANDL, F.; FOSTER, G.; KATTER, J.; KAUFMAN, B.; LEA, S. The financial crisis and its effects: Perspectives from economics and psychology. **Journal of Behavioral and Experimental Economics**, 50: 10–12, 2014.

GRIES, T.; MÜLLER, V. A perfect match? Are dogmatic belief systems simply a reconciliation of cognitive and emotional human needs? IN: CARUSO, R. **Peace economics, peace science and public policy**. Berlin: De Gruyter, 2017

GRUCHY, A. **Modern economic thought**: the American contribution. New York: Prentice Hall, Inc., 1947.

GRUNDMANN, T. BonJour's self-defeating argument for coherentism. **Erkenntnis**, 50(2-3): 463-479, 1999.

GUNN, G. Interdisciplinary studies. IN: GIBALDI, J. **Introduction to scholarship in modern languages and literatures**. New York: Languages Association of America, 1992.

GUO, R. **An economic inquiry into the nonlinear behaviors of nations**: dynamic developments and the origins of civilizations. Houndmills: Palgrave Macmillan, 2017.

HALDANE, A. G.; TURRELL, A. E. An interdisciplinary model for macroeconomics. **Oxford Review of Economic Policy**, 34(1–2): 219–251, 2018.

HAMERMESH, D. Six decades of top economics publishing: who and how? **Journal of Economic Literature**, 51(1): 162-172, 2013.

HAMERMESH, D. Citations in economics: measurement, uses, and impacts. **Journal of Economic Literature**, 56(1), 115-156, 2018.

HARRISS, J. The case for cross-disciplinary approaches in international development. **World Development**, 30(3): 487–496, 2002.

HECK, J.; ZALESKI, P. The most frequent contributors to the elite economics journals: half century of contributions to the "Blue Ribbon Eight". **Journal of Economics and Finance**, 30(1): 1-37, 2006.

HECKHAUSEN, H. Discipline and interdisciplinarity. IN: BERGER, G.; APOSTEL, L.; BRIGGS, A.; MICHAUD, G. **Interdisciplinarity**: problems of teaching and research in universities. Nice: Organization for Economic Cooperation and Development, 1972.

HECKMAN, J.; MOKTAN, S. Publishing and promotion in economics: the tyranny of the top five. **INET Working Papers**, n. 82, September 2018.

HELMSING, A.; VELLEMA, S. **Value chains social inclusion and economic development**: contrasting theories and realities. London and New York: Routledge, 2012.

HERFELD, C.; DOEHNE, M. Five reasons for the use of network analysis in the history of economics. **Journal of Economic Methodology**, 25(4): 311-328, 2018.

HERMANN, A. **The systemic nature of the economic crisis**: the perspectives of heterodox economics and psychoanalysis. London and New York: Routledge, 2015

HERZOG, B. Interdisciplinary analysis of Luhmann's sociological theory on the Euro-crisis. **Economics and Sociology**, 8(2): 102–114, 2015.

HINO, H. Conclusion: key findings of our interdisciplinary dialogue. IN: HINO, H.; LONSDALE, J.; RANIS, G.; STEWART, F. **Ethnic diversity and economic instability in Africa**. Cambridge: Cambridge University Press, 2012.

HODGSON, G. The concept of emergence in social science: its history and importance. **Emergence**, 2(4): 65-77, 2000.

HOLLINGSWORTH, R.; MÜLLER, K. Transforming socio-economic with a new epistemology. **Socio-Economic Review**, 3(1): 395-426, 2008.

HORODNIC, I. A.; RODGERS, P.; WILLIAMS, C.; MOMTAZIAN, L. **The informal economy**: exploring drivers and practices. London and New York: Routledge, 2017.

HOSSEIN-ZADEH, I. **Beyond mainstream explanations of the financial crisis**: parasitic finance capital. London and New York: Routledge, 2014.

HOSSEINI, H. The arrival of behavioral economics: from Michigan, or the Carnegie School in the 1950s and the early 1960s? **Journal of Socio-Economics**, 32(4): 391–409, 2003.

HOURS, B.; AHMED, P. O. **An anthropological economy of debt**. London and New York: Routledge, 2015.

HOYT, E. Choice as an interdisciplinary area. **Quarterly Journal of Economics**, 79(1): 106–112, 1965.

HU, Z.; TIAN, W.; XU, S.; ZHANG, C. Four pitfalls in normalizing citation indicators: an investigation of ESI's selection of highly cited papers. **Journal of Informetrics**, 12(4): 1133-1145, 2018.

HÜBENTHAL, U. Interdisciplinarity thought. **Issues in Integrative Studies**, 12: 55-75, 1994.

HULME, A. **The changing landscape of China's consumerism**. Cambridge: Chandos Publishing, 2014.

HVIDTFELDT, R. **The structure of interdisciplinary science**. London: Palgrave Macmillan, 2018.

INNOCENTI, A. How a psychologist informed economics: the case of Sidney Siegel. **Journal of Economic Psychology**, 31(3): 421–434, 2010.

ISSBERNER, L.-R.; LÉNA, P. **Brazil in the Anthropocene**: conflicts between predatory development and environmental policies. London and New York: Routledge, 2016.

ITTNER, H.; OHL, C. International negotiations on climate change: integrating justice psychology and economics - a way out of the normative blind alley? IN: KALS, E.; MAES, J. **Justice and conflicts: theoretical and empirical contributions**. London: Springer, 2012.

IZBERK-BILGIN, E. An interdisciplinary review of resistance to consumption, some marketing interpretations, and future research suggestions. **Consumption Markets and Culture**, 13(3): 299–323, 2010.

JACKSON, C. Disciplining gender? **World Development**, 30(3): 497–509, 2002.

JACOBS, J. **In defense of disciplines**: interdisciplinarity and specialization in the research university. Chicago and London: The University of Chicago Press, 2013.

JOACHIM, H. **The nature of truth**. Oxford: The Clarendon Press, 1906.

JOVANOVIC, F. A comparison between qualitative and quantitative histories: the example of the efficient market hypothesis. **Journal of Economic Methodology**, 25(4): 291-310, 2018.

KALAITZIDAKIS, P.; MAMUNEAS, T.; STENGOS, T. Rankings of academic journals and institutions in economics. **Journal of the European Economic Association**, 1(6): 1346-1366, 2003.

KALIL, A.; DELEIRE, T. **Family investments in children's potential**: resources and parenting behaviors that promote success. Abingdon: Taylor & Francis, 2004.

KANBUR, R.; RAJARAM, P. K.; VARSHNEY, A. Ethnic diversity and ethnic strife: an interdisciplinary perspective. **World Development**, 39(2): 147–158, 2011.

KANEKLIN, C. Human resources: Economics and organization. **Rivista Internazionale di Scienze Sociali**, (3–4): 529–538, 2009.

KAPELLER, J. Citation metrics: serious drawbacks, perverse incentives, and strategic options for heterodox economics. **American Journal of Economics and Sociology**, 69(5): 1376-1408, 2010.

KELLY, M.; BRUESTLE, S. Trend of subjects published in economics journals 1969-2007. **Economic Inquiry**, 49(3): 658-673, 2011.

KENNEDY, E. H.; COHEN, M. J.; KROGMAN, N. T. **Putting sustainability into practice**: applications and advances in research on sustainable consumption. Cheltenham: Edward Elgar, 2015.

KIMBROUGH, E. O.; SHEREMETA, R. M. Theories of conflict and war. **Journal of Economic Behavior and Organization**, 159 384–387, 2019.

KING, J. E. Sixteen questions for Fine and Milonakis. **Historical Materialism**, 20(3): 39–60, 2012.

KIRCHLER, E.; HÖLZL, E. Twenty-five years of the Journal of Economic Psychology (1981-2005): a report on the development of an interdisciplinary field of research. **Journal of Economic Psychology**, 27(6): 793–804, 2006.

KIRCHNER, C. Public choice and new institutional economics a comparative analysis in search of co-operation potentials. IN: BAAKE, P.; BORCK, R. **Public economics and public choice**: contributions in honor of Charles B. Blankart. London: Springer, 2007.

KLEER, J.; NAWROT, K. A. **The rise of megacities**: challenges, opportunities and unique characteristics. New Jersey: World Scientific, 2018.

KLEIN, J. T. A conceptual vocabulary of interdisciplinary science. IN: WEINGART, P.; STEHR, N. **Practising interdisciplinarity**. Toronto, Buffalo, London: University of Toronto Press, 2000.

KLEIN, J. T. A taxonomy of interdisciplinarity. IN: FRODEMAN, R.; KLEIN, J. T.; MITCHAM C. **The Oxford handbook of interdisciplinarity**. Oxford: Oxford University Press, 2010.

KLINTMAN, M. **Human sciences and human interests**: integrating the social, economic, and evolutionary sciences. London and New York: Routledge, 2016.

KNOX, H.; SAVAGE, M.; HARVEY, P. Social networks and the study of relations: networks as method, metaphor and form. **Economy and Society**, 35(1): 113–140, 2006.

KORNAI, J. Disciplines of social sciences: separation or cooperation? **Politicka Ekonomie**, 56(1): 5–16, 2008.

KOUTSOBINAS, T. **The political economy of status**: superstars, markets and culture change. Cheltenham: Edward Elgar, 2014.

KUIPER, E.; BARKER, D. K. **Feminist economics and the World Bank**: history, theory and policy. London and New York: Routledge, 2005.

KUMAR, M.; KUMAR, P. Valuation of the ecosystem services: A psycho-cultural perspective. **Ecological Economics**, 64(4): 808–819, 2008.

KUMAR, R.; MURALI, P. **Institutional dynamics and the evolution of the Indian economy**. Houndmills: Palgrave Macmillan, 2009.

KUORIKOSKI, J.; YLIKOSKI, P. Explanatory relevance across disciplinary boundaries: the case of neuroeconomics. **Journal of Economic Methodology**, 17(2): 219–228, 2010.

KYRCHANIV, M. Political and sociocultural factors of post-Soviet economic regionalisation: from economic anthropology to identity economics. **Economic Annals-XXI**, 155(11–12): 22–28, 2015.

KYRCHANIV, M. Local currencies: Economic anthropology, regional performativism and modernization of identity. **Economic Annals-XXI**, 159(5–6): 10–15, 2016.

LABAND, D.; PIETTE, M. Favoritism versus search for good papers: empirical evidence regarding the behavior of journal editors. **Journal of Political Economy**, 102(1): 194-203, 1994.

LANDAUER, C. Synthesis and specialization in the social sciences. **Kyklos**, 19(4): 660–669, 1966.

LATTUCA, L. **Creating interdisciplinarity**: interdisciplinary research and teaching among college and university faculty. Nashville: Vanderbilt University Press, 2001.

LAWSON, T. **Economics and reality**. London and New York: Routledge, 1997.

LAZEAR, E. Economic imperialism. **The Quarterly Journal of Economics**, 115(1): 99-146, 2000.

LEPPÄLÄ, S. An epistemological perspective on knowledge transfers: from tacitness to capability and reliability. **Industry and Innovation**, 19(8): 631-647, 2012.

LERNER, A. The economics and politics of consumer sovereignty. **The American Economic Review**, 62(1/2): 258-266, 1972.

LI, M.; TRACER, D. P. **Interdisciplinary perspectives on fairness, equity, and justice**. London: Springer, 2017.

LONG, F. The Role of Social Scientific Inquiry in Technology Transfer. American **Journal of Economics and Sociology**, 38(3): 261–274, 1979.

LUTZ, M. A. Social economics and economics imperialism. **Forum for Social Economics**, 23(1): 1–12, 1993.

MACINNIS, D. J.; FOLKES, V. S. The disciplinary status of consumer behavior: a sociology of science perspective on key controversies. **Journal of Consumer Research**, 36(6): 899–914, 2010.

MAGATTI, M. **The crisis conundrum**: how to reconcile economy and society. Houdmills: Palgrave Macmillan, 2017.

MAHUTGA, M. C. Global models of networked organization, the positional power of nations and economic development. **Review of International Political Economy**, 21(1): 157–194, 2014.

MÄKI, U. Symposium on explanations and social ontology 2: explanatory ecumenism and economics imperialism. **Economics and Philosophy**, 18(2): 235–257, 2002.

MÄKI, U. Economics imperialism: concept and constraints. **Philosophy of the Social Sciences**, 39(3): 351-380, 2009.

MÄKI, U. On the philosophy of the new kiosk economics of everything. **Journal of Economic Methodology**, 19(3): 219–230, 2012.

MÄKI, U. **Empirical turn in economics?** Keynote Speak at the 6th Latin American Conference of the History of Economic Thought, Bogotá, 2017.

MÄKI, U.; MARCHIONNI, C. Is geographical economics imperializing economic geography? **Journal of Economic Geography**, 11(4): 645–665, 2011.

MARCHIONATTI, R.; CEDRINI, M. **Economics as social science**: economics imperialism and the challenge of interdisciplinarity. London and New York: Routledge, 2016.

MARYUDI, A.; NURROCHMAT, D. R.; GIESSEN, L. Research trend: forest policy and governance – future analyses in multiple social science disciplines. **Forest Policy and Economics**, 91: 1–4, 2018.

MARZANO, M.; CARSS, D. N.; BELL, S. Working to make interdisciplinarity work: investing in communication and interpersonal relationships. **Journal of Agricultural Economics**, 57(2): 185–197, 2006.

MAXWELL, S. The social scientist in farming systems research. **Journal of Agricultural Economics**, 37(1): 25–35, 1986.

MAY, A.; SUMMERFIELD, G. Creating a Space where Gender Matters: Elinor Ostrom (1933-2012) talks with Ann Mari May and Gale Summerfield. **Feminist Economics**, 18(4): 25–37, 2012.

MAY, T.; PERRY, B. **Cities and the knowledge economy**: promise, politics and possibilities. London and New York: Routledge, 2017.

MCDERMOTT, G. A. **Embedded politics**: industrial networks and institutional change in postcommunism. Ann arbor: The University of Michigan Press, 2010.

MCNALLY, D. From fetishism to 'shocked disbelief ': economics, dialectics and value theory. **Historical Materialism**, 20(3): 9–23, 2012.

MEHDIZADEH, M. An analysis of authors and institutions contributing to the American Journal of Economics and Sociology, 1981–1993. **American Journal of Economics and Sociology**, 52(4): 459–466, 1993.

MILLIS, H.; JOHNSON, A.; BARNETT, G. Report of the representative of the Association to the Social Science Research Council. **American Economic Review**, 21(1): 286-288, 1931.

MILONAKIS, D.; FINE, F. **From political economy to economics**: method, the social and the historical in the evolution of economic theory. London and New York: Routledge, 2008.

MIROWSKI, P. **More heat than light**: economics as social physics: physic as nature's economics. Cambridge: Cambridge University Press, 1989.

MITCHELL, W. **The backward art of spending money**. New York: McGraw-Hill Book Company, Inc., 1937.

MOELLER, J. O. Conventional economic theory: a critique highlighting flaws in American style capitalism. **Singapore Economic Review**, 56(1): 1–18, 2011.

MONTELLA, M. Cultural value. IN: GOLINELLI, G. **Cultural heritage and value creation**. London: Springer, 2015.

MOODY, J.; LIGHT, R. A view from above: the evolving sociological landscape. **The American Sociologist**, 37(2): 67-86, 2006.

MORGAN, C. L. **The emergence of novelty**. London: Williams and Norgate, 1933.

MOWLES, C. Ralph Stacey: taking experience seriously. IN: SZABLA, D.; PASMORE, W.; BARNES, M.; GIPSON, A. **The Palgrave handbook of organizational change thinkers**. Houndmills: Palgrave Macmillan, 2017.

MUCELLI, A.; SPIGARELLI, F. **Healthcare policies and systems in Europe and China**: comparisons and synergies. New Jersey: World Scientific, 2017.

MURADOGLU, G.; HARVEY, N. Behavioural finance: the role of psychological factors in financial decisions. **Review of Behavioral Finance**, 4(2): 68–80, 2012.

MUTHOO, M. K. The renewable resource planning problem with special reference to kashmir. **Socio-Economic Planning Sciences**, 4(2): 187–200, 1970.

NACHANE, D. M. Methodology of the social sciences in the age of complexity: unity, autonomy or integration? **Journal of Interdisciplinary Economics**, 27(1): 1–32, 2015.

NEUTELEERS, S.; ENGELEN, B. Talking money: how market-based valuation can undermine environmental protection. **Ecological Economics**, 117: 253–260, 2015.

NEWTON, A. C.; CANTARELLO, E. **An introduction to the green economy**: science, systems and sustainability. London and New York: Routledge, 2014.

NIELSEN, K.; OSKARSSON, P. **Industrialising rural India**: land, policy and resistance. London and New York: Routledge, 2016.

NIELSEN, P.; MORGAN, J. No new revolution in economics? Taking Thompson and Fine forward. **Economy and Society**, 34(1): 51–75, 2005.

NIK-KHAH, E.; VAN HORN, R. Inland empire: economics imperialism as an imperative of Chicago neoliberalism. **Journal of Economic Methodology**, 19(3): 259–282, 2012.

NISONGER, T. Use of the Journal Citation Reports for serials management in research libraries: an investigation of the effect of self-citation on journal rankings in library and information science and genetics. **College & Research Libraries**, 61(3): 263-275, 2000.

NOOTEBOOM, B. **Inter-firm collaboration, learning and networks**: an integrated approach. London and New York: Routledge, 2003.

NUROĞLU, E.; BAYRAK MEYDANOĞLU, E. S.; BAYRAKLI, E. **Turkish-German affairs from an interdisciplinary perspective**. Berlin: Peter Lang AG, 2015.

OLSSON, E. Coherence theories of epistemic justification. IN: ZALTA, E.; NODELMAN, U.; ALLEN, C.; ANDERSON, R. (Org.). **Stanford Encyclopedia of Philosophy**. Stanford: The Metaphysics Research Lab, 2015, 2017.

PAHA, J. **Competition law compliance programmes**: an interdisciplinary approach. London: Springer, 2016.

PANHANS, M.; SINGLETON, J. The empirical economist's toolkit: from models to methods. **History of Political Economy**, 49(Supplement): 127-157, 2017.

PEARSE, R.; CONNELL, R. Gender Norms and the Economy: insights from Social Research. **Feminist Economics**, 22(1): 30–53, 2016.

PEARSON, H. Ground between two stones: Melville Herskovits and the fate of economic anthropology. **History of Political Economy**, 42(Supplement): 165–195, 2010.

PIAGET, J. The epistemology of interdisciplinary relationships. IN: BERGER, G.; APOSTEL, L.; BRIGGS, A.; MICHAUD, G. **Interdisciplinarity**: problems of teaching and research in universities. Nice: Organization for Economic Cooperation and Development, 1972.

PIETERS, R.; BAUMGARTNER, H. Who talks to whom? Intra- and interdisciplinary communication of economics journals. **Journal of Economic Literature**, 40(2): 483-509, 2002.

PIETRYKOWSKI, B. **The political economy of consumer behavior**: contesting consumption. London and New York: Routledge, 2009.

PIGA, G.; TREUMER, S. **The applied law and economics of public procurement**. London and New York: Routledge, 2013.

PIXLEY, J. **New perspectives on emotions in finance**: the sociology of confidence, fear and betrayal. London and New York: Routledge, 2012.

PLUTA, J. E. Evolutionary alternatives to equilibrium economics: some suggested applications. **American Journal of Economics and Sociology**, 69(4): 1155–1177, 2010.

POLANYI, M. **The tacit dimension**. Chicago and London: The University of Chicago Press, 1966.

POSTON, T. **Reason and explanation**: a defense of explanatory coherentism. Houndmills: Palgrave Macmillan, 2014.

PRATT, A. C.; JEFFCUTT, P. **Creativity, innovation and the cultural economy**. London and New York: Routledge, 2009.

PRESSMAN, S. On financial frauds and their causes: investor overconfidence. **American Journal of Economics and Sociology**, 57(4): 405–421, 1998.

RAMELLA, F. **Sociology of economic innovation**. London and New York: Routledge, 2015.

RAPPAPORT, S. Economics methodology: rhetoric or epistemology? **Economics and Philosophy**, 4(1): 110-128, 1988.

RASUMOVSKAYA, E. M.; KUTSEVOL, N.; BATYRSHIN, G.; POPOV, M.; IBRAGIMOVA, G. Consumer behavior: society forming factor or destroying factor? **International Journal of Economic Perspectives**, 11(3): 1724–1729, 2017.

REISMAN, D. Richard Titmuss: welfare as good conduct. **European Journal of Political Economy**, 20(3): 771–794, 2004.

REYNAUD, P.-L. Niveau de comportement et prise de conscience en psychologie economique. **Journal of Economic Psychology**, 1(3): 183–195, 1981.

RICE, R.; BORGMAN, C.; REEVES, B. Citation networks of communication journals, 1977-1985: cliques and positions, citations made and citations received. **Human Communication Research**, 15(2): 256-283, 1988.

RIGNEY, D.; BARNES, D. Patterns of interdisciplinary citation in the social sciences. **Social Sciences Quarterly**, 61(1): 114-127, 1980.

RIPSAS, S. Towards an interdisciplinary theory of entrepreneurship. **Small Business Economics**, 10(2): 103–115, 1998.

RODRIGUES, M. J. **Europe, globalization and the Lisbon agenda**. Cheltenham: Edward Elgar, 2009.

ROL, M. Idealization, abstraction, and the policy relevance of economic theories. **Journal of Economic Methodology**, 15(1): 69–97, 2008.

ROL, M. On ceteris paribus laws in economics (and elsewhere): why do social sciences matter to each other? **Erasmus Journal for Philosophy and Economics**, 5(2): 27–53, 2012.

ROLIN, K. Scientific imperialism and epistemic injustice. IN: MÄKI, U.; WALSH, A.; PINTO, M. **Scientific imperialism**: exploring the boundaries of interdisciplinarity. London and New York: Routledge, 2018.

ROSA, H.; HENNING, C. **The good life beyond growth**: new perspectives. London and New York: Routledge, 2017.

ROTHSCHILD, K. W. Political economy or economics? Some terminological and normative considerations. **European Journal of Political Economy**, 5(1): 1–12, 1989.

RUGER, J. P. **Health and social justice**. Oxford: Oxford University Press, 2010.

SAAD-FILHO, A.; YALMAN, G. L. **Economic transitions to neoliberalism in middle-income countries**: policy dilemmas, crises, mass resistance. London and New York: Routledge, 2009.

SAAD-LESSLER, J.; RICHMAN, K. The impact of collectivism on savings behavior: a case study of Mexican-Americans and non-Mexican Latinos. **Review of Economics of the Household**, 12(3): 493–515, 2014.

SALEH, M. A 'new' economic history of the Middle East and North Africa (MENA) region. **Economics of Transition**, 25(2): 149–163, 2017.

SAPRONOV, A.; IVANOV, V. Dynamics of social polarization in the Russian society in conditions of economic instability. **Economic Annals-XXI**, 157(3–4): 56–58, 2016.

SCHROEDLER, T. **The value of foreign language learning**: a study on linguistic capital and the economic value of language skills. London: Springer, 2017.

SCHUMPETER, J. **History of economic analysis**. London: Routledge, 2006.

SCIDA, G. Migrations and labor: sociological perspectives. **Sociologia del lavoro**, 64: 26-49,189, 1996.

SCOPUS Info. Elsevier B. V. Available on: <http://scopus.com>.

SHERRY J.; FISCHER, E. **Explorations in consumer culture theory**. London and New York: Routledge, 2008.

SHMELEV, S. E.; SHMELEVA, I. A. **Sustainability analysis**: an interdisciplinary approach. Houndmills: Palgrave Macmillan, 2012.

SIBBEL, A. Consumer science: a science for sustainability. **International Journal of Consumer Studies**, 27(3): 240, 2003.

SIEGEL, D. **World Scientific reference on innovation**. New Jersey: World Scientific, 2018.

SIEGERS, J. J. Interdisciplinary economics. **De Economist**, 140(4): 531–547, 1992.

SILVA, A. S. Global crisis: A comprehensive interdisciplinary approach to paradigm change. **Review of Keynesian Economics**, 3(1): 63–76, 2015.

SILVESTROV, S. N.; ZELDNER, A. G.; OSIPOV, V. S. Introduction to the theory of economic dysfunction. **Mediterranean Journal of Social Sciences**, 6(3): 394–399, 2015.

ŠIMELYTE, A.; KORSAKIENE, R.; ŠČEULOVS, D. Americanization in Lithuania as a driving force for globalization. **Journal of Open Innovation: Technology, Market, and Complexity**, 3(3): 1-13, 2017.

SMELSER, N. J.; SWEDBERG, R. **The handbook of economic sociology**: Second edition. Princeton: Princeton University Press, 2010.

SOTIROV, M.; SALLNÄS, O.; ERIKSSON, L. O. Forest owner behavioral models, policy changes, and forest management: an agent-based framework for studying the provision of forest ecosystem goods and services at the landscape level. **Forest Policy and Economics**, 103: 79-89, 2017.

STAFFORD, K.; TEWS, M. Enhancing work-family balance research in family businesses. **Family Business Review**, 22(3): 235–238, 2009.

STAIANO, S. Equality policies and inequality: theoretical and institutional aspects. **Sociologia del Lavoro**, (144): 103–117, 2016.

STAR, S.; GERSON, E. The management and dynamics of anomalies in scientific work. **The Sociological Quarterly**, 28(2): 147-169, 1987.

STAUDINGER, U.; BOWEN, C. E. A systemic approach to aging in the work context. **Journal for Labour Market Research**, 44(4): 295–306, 2011.

STERN, P. The socio-economic perspective and its institutional prospects. **Journal of Socio-Economics**, 22(1): 1–11, 1993.

STEVENSON, J. Reasonableness in morals. **Journal of Business Ethics**, 8(2-3): 95-107, 1989.

STIGLER, G. Economics: the imperial science? **The Scandinavian Journal of Economics**, 86(3): 301-313, 1984.

SUGIURA, K. Institutional economics needs interdisciplinary studies of social sciences. **Journal of Economic Issues**, 33(2): 257–264, 1999.

SUN, W.; GUO, Y. **Unequal China**: the political economy and cultural politics of inequality. London and New York: Routledge, 2013.

SVIZZERO, S.; TISDELL, C. A. Economic evolution, diversity of societies and stages of economic development: A critique of theories applied to hunters and gatherers and their successors. **Cogent Economics and Finance**, 4(1): 1-18, 2016.

SWEDBERG, R. **Principles of economic sociology**. Princeton: Princeton University Press, 2009.

SZOSTAK, R. Classifying heterodoxy. **The Journal of Philosophical Economics**, 1(2): 97-126, 2008.

SZOSTAK, R. **The causes of economic growth**: interdisciplinary perspectives. London: Springer, 2009.

THOMAS, K.; CHAN, J. **Handbook of research on creativity**. Cheltenham: Edward Elgar, 2013.

TILMAN, R.; FONTANA, A. Italian debate and dialogue on Thorstein Veblen: the evolution of appreciation for his contributions despite the apathy of the intelligentsia. **American Journal of Economics and Sociology**, 44(1): 81–95, 1985.

TINBERGEN, J. Some neglected determinants of welfare functions. **Journal of Economic Psychology**, 1(1): 25–37, 1981.

TITTENBRUN, J. **Concepts of capital**: the commodification of social life. New Jersey: Transaction Publishers, 2017.

TRUC, A. Is 'new' behavioral economics 'mainstream'? **Journal of Economic Methodology**, 25(1): 83–104, 2018.

TURNER, R.; GEORGIOU, S.; GREN, I.; WULFF, F.; BARRETT, S.; SÖDERQVIST, T.; BATEMAN, I.; FOLKE, C.; LANGAAS, S.; ZYILICZ, T.; MÄLER, K.; MARKOWSKA, A. Managing nutrient fluxes and pollution in the Baltic: an interdisciplinary simulation study. **Ecological Economics**, 30(2): 333–352, 1999.

TUYON, J.; AHMAD, Z. Psychoanalysis of investor irrationality and dynamism in stock market. **Journal of Interdisciplinary Economics**, 30(1): 1–31, 2018.

UR REHMAN, T. Frontiers of behavioral economics. IN: UR REHMAN, T. **Behavioral economics**: trends, perspectives and challenges. Hauppauge: Nova Science, 2018.

URBAN, F.; NORDENSVÄRD, J. **Low carbon development**: key issues. London and New York: Routledge, 2013.

VAHABI, M. **The political economy of destructive power**. Cheltenham: Edward Elgar, 2004.

VAN DUSEN, E.; GAUCHAN, D.; SMALE, M. On-Farm conservation of rice biodiversity in Nepal: a simultaneous estimation approach. **Journal of Agricultural Economics**, 58(2): 242–259, 2007.

VANDERMEULEN, V.; VAN HUYLENBROECK, G. Designing trans-disciplinary research to support policy formulation for sustainable agricultural development. **Ecological Economics**, 67(3): 352–361, 2008.

VIGANÒ, E.; ANTONELLI, G.; BISCHI, G.; TRAMONTANA, F. Consumption and consumers of food products in the postmodern society. **Economia Agro-Alimentare**, 17(1): 59–80, 2015.

VINOKUROV, S.; MEDVED, A.; MIERIN, L. Influence of the information background on the economic behavior of households. **Ekonomicheskaya Politika**, 13(5): 66–79, 2018.

VROMEN, J. The booming economics-made-fun genre: more than having fun, but less than economics imperialism. **Erasmus Journal for Philosophy and Economics**, 2(1): 70–99, 2009.

WADE, B.; STONE, J. Overcoming disciplinary and institutional barriers: an interdisciplinary course in economic and sociological perspectives on health issues. **Journal of Economic Education**, 41(1): 71–84, 2010.

WALLENBORN, G. Rebounds are structural effects of infrastructures and markets. **Frontiers in Energy Research**, 6(99): 1-13, 2018.

WALLERSTEIN, I. Anthropology, sociology, and other dubious disciplines. **Current Anthropology**, 44(4): 453-465, 2003.

WEB OF SCIENCE. **Clarivate Analytics**: Web of Science Core Collection. Available on: <http://wokinfo.com/>.

WEDGWOOD, R. Normativity. IN: LAFOLLETTE, H. **The international encyclopedia of ethics**. Malden: Wiley-Blackwell, 2013.

WEINGART, P. Interdisciplinarity: the paradoxical discourse. IN: WEINGART, P.; STEHR, N. **Practising interdisciplinarity**. Toronto, Buffalo, London: University of Toronto Press, 2000.

WEINGART, P.; STEHR, N. **Practising interdisciplinarity**. Toronto, Buffalo, London: University of Toronto Press, 2000.

WHITMARSH, L.; KÖHLER, J. Climate change and cars in the EU: the roles of auto firms, consumers, and policy in responding to global environmental change. **Cambridge Journal of Regions, Economy and Society**, 3(3): 427–441, 2010.

WILLIAMSON, O. E. Interdisciplinary social science: the transaction cost economics project. IN: SOLOW, R.; MURRAY, J. **Economics for the curious**: inside the minds of 12 Nobel laureates. Houndmills: Palgrave Macmillan, 2015.

WINSTON, G. Introduction. IN: WINSTON, G.; TEICHGRAEBER III, R. **The boundaries of economics**. Cambridge: Cambridge University Press, 1988.

WINTHROP, H. Policy and planning programs as goals of scientific work: interdisciplinary training for social planning as a case study in applied social science. **American Journal of Economics and Sociology**, 34(3): 225–245, 1975.

WOLNICKI, M. Restoring pragmatism in American governance. **International Journal of Social Economics**, 39(7): 490–502, 2012.

WORTHAM, S. Bringing criticism to account: economy, exchange and cultural theory. **Economy and Society**, 26(3): 400–418, 1997.

YANG, B.; LESTER, D. New directions for economics. **Journal of Socio-Economics**, 24(3): 433–446, 1995.

YANG, K. **Entrepreneurship in China**. London and New York: Routledge, 2012.

YOLLES, M. Modelling pathologies in social collectives. **European Journal of International Management**, 1(1/2): 81-103, 2007.

YOUNG, J. The coherence theory of truth. IN: ZALTA, E.; NODELMAN, U.; ALLEN, C.; ANDERSON, R. (Org.). **Stanford Encyclopedia of Philosophy**. Stanford: The Metaphysics Research Lab, 2015, 2013.

ZAFIROVSKI, M. Extending the rational choice model from the economy to society. **Economy and Society**, 29(2): 181–206, 2000a.

ZAFIROVSKI, M. Economic and sociological approaches to institutions: economy, society and law. **European Journal of Law and Economics**, 10(1): 7–30, 2000b.

ZAGLER, M. **International tax coordination**: an interdisciplinary perspective on virtues and pitfalls. London and New York: Routledge, 2010.

ZAOUAL, H. Development, organizations and territory: a Southern/northern approach. **Innovations**, 26(2): 9–40, 2007.