

**UNIVERSITY RESEARCH GOVERNANCE AND THE  
COLOMBIAN SCIENTIFIC JOURNAL INDEX "PUBLINDEX."  
UNDERSTANDING THE TENSIONS**

**DISSERTATION**

To obtain the degree of doctor at the University of Twente, on then addition, this authority of the Rector Magnificus, prof. Dr. Tom Veldkamp, on account of the decision of the Doctorate Board, to be publicly defended on Friday 13<sup>th</sup> of May 2022 at 12:45.

**By**

María Alejandra Tejada-Gómez

born on the 25<sup>th</sup> of November 1979 in Bogotá, Colombia

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*María Alejandra Tejada-Gómez*

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This dissertation has been approved by:  
Supervisor  
prof. dr. S. Kuhlmann

Co-supervisor  
dr. H.G. Ordoñez Matamoros

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## **Graduation Committee:**

Chair / secretary:

prof.dr. T. Boundarouk

Supervisor:

prof. dr. S. Kuhlmann  
Universiteit Twente, BMS, Science, Technology & Policy  
Studies

Co-supervisor:

dr. H.G. Ordoñez Matamoros  
Universiteit Twente, BMS, Science, Technology & Policy Studies

Committee Members:

prof.dr. T. Bondarouk  
Universiteit Twente, BMS, Industrial Engineering &  
Business Information Systems

prof.dr. B.J.R. van der Meulen  
Universiteit Twente, BMS, Center for Higher Education  
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## Content

List of figures .....	x
List Annexes .....	xiii
Acronyms .....	xiv
Acknowledgments .....	xv
ABSTRACT .....	xviii
INTRODUCTION .....	28
1.1. BACKGROUND .....	30
1.1.1. Scientific journal publishing in Latin America and Colombia .....	33
1.1.2. Publindex – the Colombian scientific journal index and policy instrument .....	36
1.1.2.1 <i>Publindex timeline of most significant events</i> .....	38
1.1.3. National Consortium for the Acquisition of Quality International Bibliographic Resources .....	42
2. PROBLEM STATEMENT .....	46
2.1. The “business - market” of journal publishing-derived tensions on university research systems .....	46
2.2. Publindex-derived tensions within its timeline .....	49
2.3. Purpose Statement .....	54
3. LITERATURE REVIEW .....	57
3.1. Scientific Journal Publindex Policy in Colombia .....	59
3.2. General Literature .....	61
3.4. Scientific journal policy-derived tensions .....	68
Tension 2.1. Epistemic Communities .....	80
Tension 2.2. Autonomy in the research agenda .....	83
Tension 2.3. Ethical misconduct .....	84
Moral Risk .....	91
Social trap or tragedy of the commons .....	92
4. CONCEPTUAL FRAMEWORK .....	94
<i>Conceptual Building Blocks</i> .....	95
4.1.1. Governance structures .....	97
4.1.2. Institutional logics .....	99

4.1.3. Actors .....	100
5. METHODOLOGY .....	105
5.1. Methods.....	106
5.2. Units of analysis .....	108
5.3. Data Collection Methods.....	112
5.3.1. Document Review .....	112
5.3.2. Observations in the field .....	113
5.4.4. Focus Groups.....	116
5.5 Data Analysis.....	117
6. FINDINGS .....	123
6.1. Institutional cases .....	124
Private University Social Mission (PRUS) .....	126
Private University Excellence Mission (PRUE).....	126
Public University Heritage mission (PUH) .....	126
6.2. Institutional cases .....	127
6.2.1. Private University Social Mission (PRUS) .....	127
6.2.1.1. Governance (PRUS) .....	127
6.2.1.2. Institutional logics (PRUS).....	128
6.2.1.3 Actors responses private University Social Mission (PRUS) .....	132
6.2.2. Private University Excellence Mission (PRUE) .....	144
6.2.2.1. Governance (PRUE) .....	144
6.2.2.2. Institutional logics (PRUE).....	145
6.2.2.3. Actors responses Private University Excellence Mission (PRUE) .....	147
6.2.3. Public University Heritage mission (PUH) .....	156
6.2.3.1. Governance (PUH).....	156
6.2.3.3 Actors respond to the public University Cultural Heritage Mission (PUH)....	160
6.3. Case Comparative Analysis .....	175
7. CONCLUSIONS.....	185
8. POLICY RECOMMENDATIONS .....	199
BIBLIOGRAPHY .....	205
Annexes .....	228

## List of tables

- Table 1.** Disciplinary Domains, Scientific journal indexing policy
- Table 2.** Scientific production Bonuses Incentives National Cases
- Table 3.** Evaluation Mechanism responses
- Table 4.** The pressures of Publish or Perish
- Table 5.** Evolution of recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work International committee of medical journals editors
- Table 6.** University Research Governance Scientific Journal Index and Policy Instrument Publindex
- Table 7.** Level of analysis University Research Governance
- Table 8.** Multilevel analysis
- Table 9.** Debates on Scientific Journal Policy Colombia 2016
- Table 10.** Statements interview protocol
- Table 11.** Interviews
- Table 12.** Coding categorization and method
- Table 13.** Correlation of statements and tensions
- Table 14.** Tensions in (PRUS)
- Table 15.** Tensions percentage priority (PRUE)
- Table 16.** Bonus Points. Publication in Journals. Decree 2912 of 2001
- Table 17.** Comparative decree 1444 vs. 1279. The point from Scientific production
- Table 18.** Tension Scientific production (PUH)
- Table 19.** Colombian Scientific Journal Index Publindex. Selected institutional cases
- Table 20.** Colombian Scientific Journal Index Publindex. Selected institutional cases
- Table 21.** Comparative analysis cases Institutional Measurable Components
- Table 22.** Case comparative multilevel analysis, actor's narratives
- Table 23.** Case comparative tensions, Self-Evaluation Matrix, Tension 1
- Table 24.** Case comparative tensions, Self-Evaluation Matrix, Tension 2
- Table 25.** International Rankings Research outputs



- Table 26.** Journal Index in Publindex per institutions (1996 – 2021)
- Table 27.** Effects on internal university research governance.
- Table 28.** Actors and Levels
- Table 29.** Publindex policy – Scientific production in Colombia, problem tree analysis.
- Table 30.** Perverse incentives, financial unsustainability, the emergence of predators, problem tree analysis
- Table 31.** Incentives, financial unsustainability, the emergence of predators, problem tree analysis
- Table 32.** Evaluation mechanism
- Table 33.** Epistemic communities, local vs. international construction
- Table 34.** Autonomy in the research agenda, problem tree analysis
- Table 35.** Ethical misconduct (Publish or perish). Problem tree
- Table 36.** Ethical misconduct (Publish or perish). Conceptual map
- Table 37.** Universities Roles the Colombian scientific journal index and policy instrument Publindex. Future Scenarios

## List of figures

- Figure 1.** University research governance and Publindex: Understanding the tensions
- Figure 2.** Introduction conceptual map
- Figure 3.** Background conceptual map
- Figure 4.** Scientific Journal Index and Policy Instruments Publindex
- Figure 5.** Timeline Colombian Scientific Journal Index Publindex
- Figure 6.** Scientific journal index system in Colombia
- Figure 7.** Colombian Journals index in Publindex 1996 – 2020
- Figure 8.** Publindex results 2018, cartoon
- Figure 9.** Tensions and their interaction
- Figure 10.** Literature Review conceptual map
- Figure 11.** Conceptual Framework map
- Figure 12.** Dynamics of the international pressures on university governance
- Figure 13.** University research governance and Publindex: Understanding the tensions.
- Figure 14.** Dynamics of the international pressures on university governance
- Figure 15.** Units of analysis
- Figure 16.** Embedded case study structure
- Figure 17.** Coding cycle (governance cases structure, actors, and tensions)
- Figure 18.** Finding Conceptual Map
- Figure 19.** University cases
- Figure 20.** Productivity in SciELO, Scopus and Wos PRUS 2002 – 2021
- Figure 21.** Institutional logics (mainly cultural-cognitive elements) tensions (PRUS)
- Figure 22.** Internationalization Scientific Journal Index and Policy Instrument Publindex (PRUS)
- Figure 23.** Scientific Incentives (PRUS)
- Figure 24.** Evaluation mechanism and the manipulation of indicators (PRUS)
- Figure 25.** Epistemic communities, local vs. international construction (PRUS)
- Figure 26.** Research agenda autonomy (PRUS)

- Figure 27.** Ethical misconduct (PRUS)
- Figure 28.** Productivity in SciELO, Scopus and Wos (PRUE) 2002 – 2021
- Figure 29.** Institutional logics (mainly cultural-cognitive elements) Actors (PRUE)
- Figure 30.** Internationalization, Scientific Journal Index and Policy Instrument Publindex (PRUE)
- Figure 31.** Incentives for scientific production (PRUE)
- Figure 32.** Evaluation mechanism and the manipulation of indicators (PRUE)
- Figure 33.** Epistemic communities (PRUE)
- Figure 34.** Research agenda autonomy (PRUE)
- Figure 35.** Ethical misconduct (PRUE)
- Figure 36.** Public Universities Salary Analysis reform decree 1279, 2002
- Figure 37.** Institutional logics (mainly cultural-cognitive elements) PRUE
- Figure 38.** Internationalization (PUH)
- Figure 39.** Incentives (PUH)
- Figure 40.** Evaluation mechanism (PUH)
- Figure 41.** Epistemic communities, local vs. international construction (PUH)
- Figure 42.** Research agenda autonomy (PUH)
- Figure 43.** Ethical misconduct (Publish or perish) (PUH)
- Figure 44.** Colombian Scientific Journal Index Publindex. Selected institutional cases
- Figure 45.** Scientific Production in Databases Wos, Scopus, SciELO per Institution
- Figure 46.** Un-balancing University Research Governance, Scientific Journal System Publindex
- Figure 47.** Balancing University Research Governance, Scientific Journal System Publindex
- Figure 48.** Number of Higher Education Institution per typology
- Figure 49.** Type of universities in Colombia
- Figure 50.** Dynamics the Colombian scientific journal index and policy instrument Publindex, Macro
- Figure 51.** Dynamics the Colombian scientific journal index and policy instrument Publindex, Meso

- Figure 52.** Dynamics the Colombian scientific journal index and policy instrument Publindex, Micro
- Figure 53.** Map focus group Publindex
- Figure 54.** Analysis of interviewees' words
- Figure 55.** Codification tension the Colombian scientific journal index and policy instrument Publindex Atlas.ti
- Figure 56.** Actors Role and academic level PRUS
- Figure 57.** Actors role and field PRUS
- Figure 58.** Actors Role and level of H Index Googles Schoolar, PRUS
- Figure 59.** Actors Role and academic level PRUE
- Figure 60.** Actors role and field PRUE
- Figure 61.** Actors Role and level of H Index Googles Scholar, PRUE
- Figure 62.** Actors Role and academic level (PUH)
- Figure 63.** Actors role and field (PUH)
- Figure 64.** Actors Role and level of H Index Google Scholar, (PUH)
- Figure 65.** Publindex policy – Scientific production in Colombia
- Figure 66.** Scientific Journal Index and Policy Instrument Publindex Actors
- Figure 67.** University research governance in the scientific journal Publindex policy in Colombia
- Figure 68.** Tensions scientific journal index and policy instrument Publindex
- Figure 69.** Incentives word cloud interviews

## List Annexes

- Annex 1.** International Rankings Research outputs
- Annex 2.** Overview higher education institutions Colombia
- Annex 3.** Journals Index in Publindex per institutions (1996 – 2021)
- Annex 4.** Multilevel actors, stakeholder
- Annex 5.** List of events scientific journal policies and university research governance, fieldwork
- Annex 6.** Focus Group pictures
- Annex 7.** Graffiti Public University
- Annex 8.** Analysis of interviewees' words
- Annex 9.** Codification tension the Colombian scientific journal index and policy instrument Publindex Atlas.ti
- Annex 10.** Private University Social Mission (PRUS)
- Annex 11.** Private University Excellence Mission (PRUE)
- Annex 12.** Public university heritage mission (PUH)
- Annex 13.** Finding Analysis
- Annex 14.** Future Scenario Scholarly Communication
- Annex 15.** Interview quotations
- Annex 16.** Cartoon Scientific Publishing
- Annex 17.** Vocabulary term list

## Acronyms

A&HCI: Arts and Humanities Citation Index

ACAC: Colombian Association's Advancement of Science

APC: Article Processing Charge

ASCUN: Colombian Association of Universities

CLACSO: Latin American Council of Social Sciences

DORA: San Francisco Declaration on Research Assessment

FECYT: Spanish Foundation for Science and Technology

JIS: Journal indexation systems

KSCD: Korean Service for citation index journal indicators

MCIC: Measurable components of institutional change

PUH: Public University with Heritage mission

PRUE: Private university with an excellent mission

PRUS: Private University with a social mission

Redalyc: Network scientific journals of Latin America and the Caribbean, Spain, and Portugal

SCI: Science Citation Index

SSCI: Social Science Citation Index

SciELO: Scientific Electronic Library Online

OJS: Open-Access Journal System

PKP: Public Knowledge Project

URG: University Research Governance

SIRES: Indexing and summary systems

WOS: Web of Science

WTMC: Netherlands Graduate Research School of Science and Technology and Modern Culture

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# UNIVERSITY RESEARCH GOVERNANCE AND THE COLOMBIAN SCIENTIFIC JOURNAL INDEX “PUBLINDEX.” UNDERSTANDING THE TENSIONS

## ABSTRACT

The logic of international rankings standards has favoured scientometric indicators for measuring research, focusing mainly on evaluating scientific journals' citations and impact factors. This focus has led national science policy makers to revise their research evaluation models to comply with international standards, prompting changes in scientific journals that have influenced local scientific production ecosystems.

This doctoral research examines the cascading effect produced by these international demands, which have prompted research-policy changes in Colombia's National Scientific Journal Index and Policy Instrument, Publindex, influencing the incentives to promote knowledge production and dissemination, sometimes with adverse effects. These internationalization-driven changes in national policy have created tensions that must be managed by university research governance and its actors. This study sets out to understand how university research governance actors respond to the tensions produced by Publindex policy changes to determine the points that should be emphasized to alleviate them.

To this end, this quantitative and qualitative study followed a timeline of Publindex's most significant events from 1994 to 2021. Literature reviews were conducted in different years, examining existing literature, policy, institutional documents, periodical discussions, and information gathered during academic events. In addition, qualitative data were obtained from 52 interviews, two focus groups, and a survey with different level actors in the scientific

journal publishing activity. Furthermore, quantitative data analysed the scientific production data from each case study. Finally, the results were analysed by the organization to understand the institutional changes.

This process revealed the tensions affecting research governance, divided into two central tensions with their associated sub-tensions. Tension 1 involves assessment factors, including internationalization, indicators as a starting point for incentives design, and evaluation mechanisms. Tension 2 involves index journal effects, affecting epistemic communities and autonomy in research agenda and encouraging the last sub-tension in this category, ethical misconduct.

The methodology used followed an embedded case study approach in multi-level environments and cases. One public and two private universities, active within Publindex processes, were used as settings to examine institutional change. The measurable components used to explain institutional change were a) Governance structures, b) Institutional logic, and c) Types of actors, the latter entailing an actors' role analysis. The cases were subsequently compared to yield the factors that should be considered to mitigate the tensions. The comparative cases showed that developed best practices in term of evaluation mechanism supporting to ethical and integrity instrument can help to mitigate the adverse effects generated for the indicators as a starting point for incentive design. New evaluation mechanism using qualitative and quantitative methods to support epistemic communities as responsible metrics and the diverse manifesto's recommendations. To alleviate the adverse effects, the key points are developing a coherence narrative at institutional level to develop intrinsic knowledge in the internal governances and institutional logics who responds to the actor's practices.

Listening to the actors' voices enables understanding the importance of inclusive evaluation mechanisms, modernizing incentives, and developing ethical policies to mitigate negative consequences. New technologies allow new spaces, formats, and models to produce, disseminate, measure, and regulate knowledge production. More importantly, finding practical solutions to the tensions created by external demands should focus, first and

foremost, on understanding how the actors, at different levels, manage and respond to them; this will ensure that the solutions are viable, given the institutional and local contexts.

**Keywords:** Scientific production policy, knowledge production, Publindex Journal Indexing System, scientific journal policy, university research governance, institutional change.

## LA GOBERNANZA DE LA INVESTIGACIÓN UNIVERSITARIA Y EL ÍNDICE DE REVISTAS CIENTÍFICAS "PUBLINDEX". ENTENDIENDO LAS TENSIONES

### RESUMEN

La lógica de los estándares de los *rankings* internacionales ha favorecido el uso de los indicadores cuantitativos para medir la investigación, que se centran principalmente en la evaluación de las citas y los factores de impacto de las revistas científicas. Este enfoque ha llevado a los responsables colombianos de la política científica a revisar sus modelos de evaluación de la investigación, en busca de cumplir con los estándares internacionales. Ello ha provocado cambios en las revistas científicas que han influido en los ecosistemas de producción científica locales.

Esta investigación doctoral examina el efecto cascada producido por estas exigencias internacionales, que han impulsado cambios en la política de investigación del Índice Nacional de Revistas Científicas de Colombia y del Instrumento de Política, Publindex y que han influido en los incentivos para fomentar la producción y difusión del conocimiento, en ocasiones con efectos adversos. Estos cambios en la política nacional, impulsados por la internacionalización, han creado tensiones que deben ser gestionadas por la gobernanza de la investigación universitaria y sus actores. Este estudio se propuso entender cómo los actores de la gobernanza de la investigación universitaria responden a las tensiones producidas por los cambios de política del Publindex para determinar los puntos en los que se debe hacer hincapié para aliviarlas.

Para ello, desde un enfoque cuantitativo y cualitativo, se siguió una línea de tiempo de los eventos más significativos de Publindex desde 1994 hasta 2021. Con una revisión bibliográfica de diferentes años, se examinaron la literatura existente, la política, los documentos institucionales, las discusiones periódicas y la información recopilada durante eventos académicos sobre el tema. Además, por un lado, se obtuvieron datos cualitativos a partir de 52 entrevistas, dos grupos de discusión y una encuesta con actores de distinto nivel en la actividad de publicación de revistas científicas. Por otro, a partir de los datos cuantitativos, se analizó información acerca de la producción científica de cada estudio de caso. Por último, en aras de comprender los cambios institucionales resultado de esta política, la organización analizó los resultados.

Este proceso reveló las tensiones que repercuten en la gobernanza de la investigación, divididas en dos tensiones centrales, con sus subtensiones asociadas. La tensión 1 tiene que ver con los factores de evaluación, incluida la internacionalización, los indicadores como punto de partida para el diseño de incentivos y los mecanismos de evaluación. La tensión 2 tiene que ver con los efectos de las revistas de índice, que afectan a las comunidades epistémicas y a la autonomía en la agenda de investigación y fomentan la última subtensión de esta categoría, la mala conducta ética.

La metodología utilizada siguió un enfoque de estudio de caso incrustado en entornos y casos multinivel. Se utilizaron como escenarios para examinar el cambio institucional una universidad pública y dos privadas, activas en los procesos de Publindex. Los componentes medibles para explicar el cambio institucional fueron: a) las estructuras de gobernanza, b) la lógica institucional y c) los tipos de actores. Posteriormente, una vez comparados los casos para obtener los factores que deberían considerarse para mitigar las tensiones, estos mostraron que las mejores prácticas desarrolladas —en términos de los mecanismos de evaluación que apoyan al instrumento de ética e integridad— ayudarían a mitigar los efectos adversos generados para los indicadores como punto de partida para el diseño de incentivos. Así, se tendría un nuevo mecanismo de evaluación que utilice métodos cualitativos y cuantitativos para apoyar a las comunidades epistémicas como métrica responsable y las diversas recomendaciones de los manifiestos de métricas

responsables. Para aliviar los efectos adversos, el punto clave es el desarrollo de una narrativa institucional coherente, por medio de un conocimiento intrínseco de los gobiernos internos y de las lógicas institucionales que responden a las prácticas de los actores institucionales y locales.

Por último, escuchar las voces de los actores les permitirá comprender a los gestores de las políticas públicas la importancia de los mecanismos de evaluación inclusivos, modernizar los incentivos y desarrollar políticas éticas capaces de mitigar las consecuencias negativas. Las nuevas tecnologías permiten nuevos espacios, formatos y modelos para producir, difundir, medir y regular la producción de conocimiento. Y, lo que es más importante, buscar soluciones prácticas a las tensiones creadas por las demandas externas, que deben centrarse, en primer lugar, en comprender cómo los actores, en diferentes ámbitos, las gestionan y responden a ellas. Esto garantizará que las soluciones sean viables, dados los contextos institucionales y locales.

**Palabras clave:** política de producción científica, producción de conocimiento, Sistema de Indexación de Revistas Publindex, política de revistas científicas, gobernanza de la investigación universitaria, cambio institucional.

## HET BESTUUR VAN UNIVERSITAIR ONDERZOEK EN DE COLOMBIAANSE WETENSCHAPPELIJKE TIJDSCHRIFTINDEX "PUBLINDEX." INZICHT IN DE SPANNINGEN

### ABSTRACT

De logica van internationale rangschikkingsnormen heeft de voorkeur gegeven aan scientometrische indicatoren voor het meten van onderzoek, waarbij de nadruk vooral lag op het evalueren van de citaties en impactfactoren van wetenschappelijke tijdschriften. Deze focus heeft ertoe geleid dat Colombiaanse wetenschapsbeleidsmakers hun onderzoeksevaluatiemodellen hebben herzien om te voldoen aan internationale

standaarden, wat veranderingen heeft teweeggebracht in Colombiaanse wetenschappelijke tijdschriften die lokale wetenschappelijke productie-ecosystemen hebben beïnvloed.

Dit doctoraatsonderzoek bestudeert de cascade-effecten die veroorzaakt worden door het aannemen van de internationale standaardeisen, wat geleid heeft tot onderzoek-beleidswijzigingen in Colombia's Nationale Wetenschappelijke Tijdschrift Index en beleidsinstrument, Publindex, die de stimulansen voor het bevorderen van kennisproductie en -verspreiding beïnvloeden, soms met nadelige gevolgen. De internationalisering-gedreven veranderingen in het nationale beleid hebben spanningen gecreëerd die moeten worden beheerd via universitair onderzoeksbestuur. Deze studie tracht te begrijpen hoe deze universitaire onderzoeksactoren reageren op de spanningen veroorzaakt door de Publindex beleidsveranderingen, om de punten te bepalen waarop de nadruk moet worden gelegd om ze te verlichten.

Deze kwantitatieve en kwalitatieve studie volgde een tijdlijn van de belangrijkste gebeurtenissen in Publindex van 1994 tot 2021. Literatuuronderzoek werd uitgevoerd vanuit verschillende invalshoeken om de spanningen van het wetenschappelijke tijdschrift Publindex te begrijpen, waarbij literatuur, beleid, institutionele documenten, periodieke discussies en informatie verzameld tijdens academische bijeenkomsten werden onderzocht. Daarnaast werden kwalitatieve gegevens verkregen uit 52 interviews, twee focusgroepen, en uit een enquête bij redacteurs in de activiteit van het uitgeven van wetenschappelijke tijdschriften en een scientiometrische analyse. Bovendien werd de wetenschappelijke productie van elke casestudy geanalyseerd aan de hand van kwantitatieve en kwalitatieve gegevens. Ten slotte werden de resultaten per casestudy geanalyseerd om de institutionele veranderingen te begrijpen.

Dit proces bracht de spanningen aan het licht die van invloed zijn op de governance van onderzoek, onderverdeeld in twee centrale spanningen met de bijbehorende sub-spanningen. Spanning 1 betreft beoordelingsfactoren, waaronder internationalisering, indicatoren als uitgangspunt voor stimuleringsontwerp, en evaluatiemechanismen.

Spanning 2 betreft index tijdschriften die invloed hebben op de epistemische gemeenschappen, de autonomie in de onderzoeksagenda en het aanmoedigen van het weglaten van de laatste sub-spanning ethisch wangedrag.

De gebruikte methodologie volgde een embedded case study benadering (Yin, 2009) in multi-level omgevingen en case studies. Een publieke en twee private universiteiten, actief binnen Publindex processen, werden gebruikt als settings om institutionele verandering te onderzoeken. De meetbare componenten die werden gebruikt om institutionele verandering te verklaren, waren (i) bestuursstructuren, (ii) institutionele logica, en (iii) soorten actoren, waarbij in het laatste geval de rol van de actoren werd geanalyseerd.

Vervolgens werden de casestudies vergeleken om na te gaan welke factoren in aanmerking moesten worden genomen om de spanningen te verminderen. Uit de vergelijking van de casestudy's is gebleken dat de beste praktijken die zijn ontwikkeld in het kader van een evaluatiemechanisme en die het ethische en integriteitsinstrument ondersteunen, kunnen helpen om de negatieve effecten die door de indicatoren worden gegenereerd, te verzachten. De studie ontwikkelt een nieuw evaluatiemechanisme dat gebruik maakt van kwalitatieve en kwantitatieve methoden, ter ondersteuning van epistemische gemeenschappen als verantwoordelijke metriek, en van de aanbevelingen van het diversiteitsmanifest. Om de negatieve effecten te verlichten, zijn de belangrijkste punten de ontwikkeling van een coherent verhaal op institutioneel niveau, om op zijn beurt de intrinsieke kennis in de interne besturen verder te ontwikkelen, en de institutionele rationale die beantwoordt aan de praktijken van de actoren.

Luisteren naar de actoren maakt het mogelijk het belang van inclusieve evaluatiemechanismen te begrijpen, stimulansen te moderniseren en ethisch beleid te ontwikkelen om de negatieve gevolgen te verzachten. Nieuwe technologieën maken nieuwe ruimten, formaten en modellen mogelijk voor het produceren, verspreiden, meten en reguleren van kennisproductie. Belangrijker nog, het vinden van praktische oplossingen voor de spanningen die ontstaan door de externe vraag moet in de eerste plaats gericht zijn op het begrijpen hoe de actoren, op verschillende niveaus, deze spanningen beheren

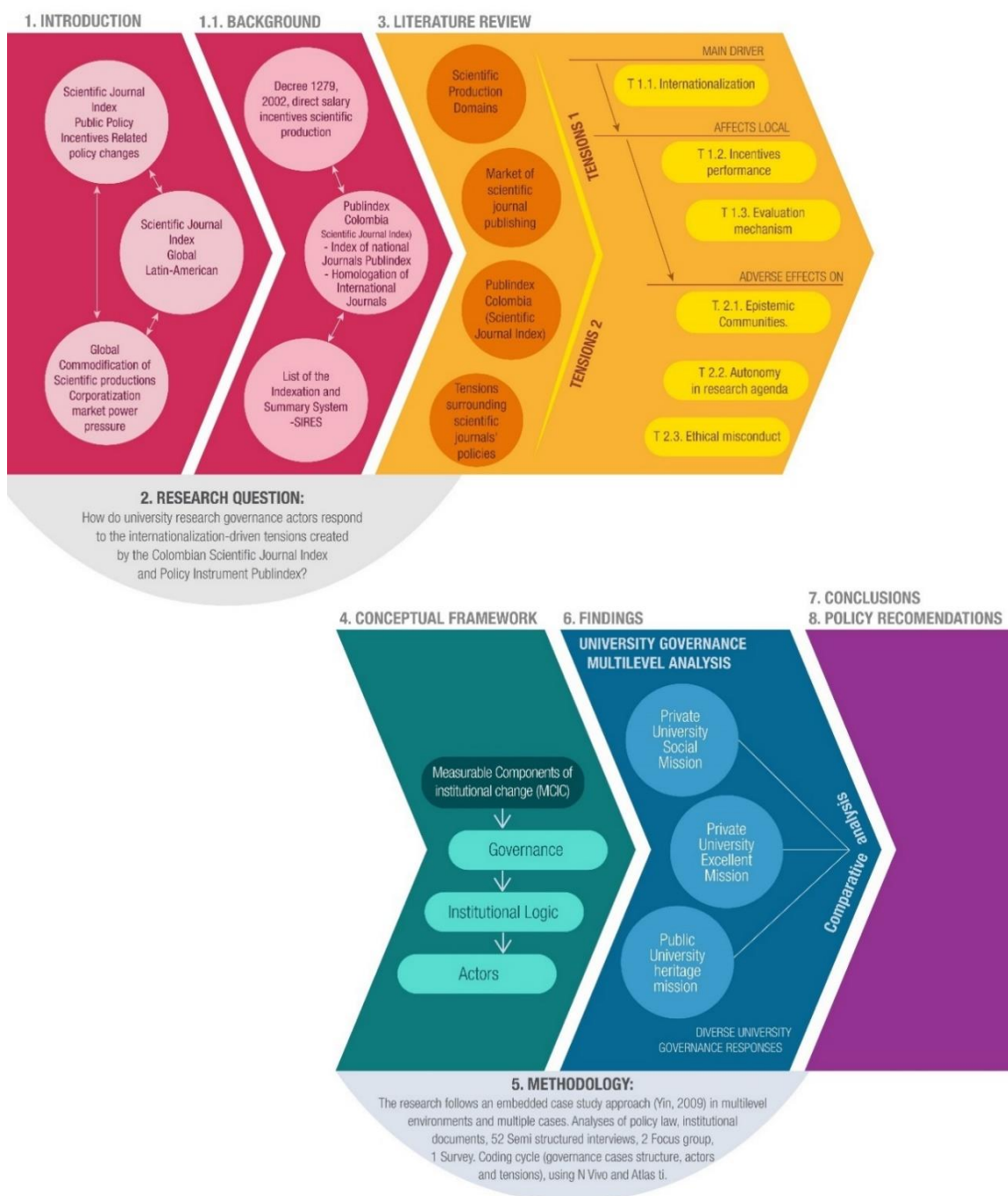


en erop reageren, waarbij gegarandeerd moet worden dat de oplossingen haalbaar zijn, gezien de institutionele en lokale context.

**Trefwoorden:** Wetenschappelijk productiebeleid, kennisproductie, Publindex Journal Indexing System, beleid inzake wetenschappelijke tijdschriften, bestuur van universitair onderzoek, institutionele verandering.

Considering that this study aims to understand how university research governance actors respond to Publindex policy’s internationalization-driven changes and the tensions they create to determine the points that should be emphasized to alleviate them, Figure 1 is provided to lay out the following structure.

Figure 1. University research governance and Publindex: Understanding the tensions





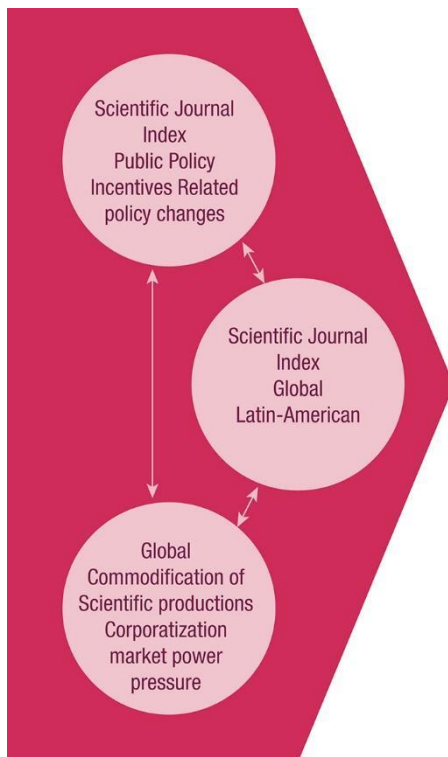
## 1. INTRODUCTION

## INTRODUCTION

In recent decades, these disciplinary approaches have been referred to as MetaScience "*Research on research*" and "*The science of science*". "The number of scientists who study science itself is overgrowing, driven in part by the realization that science isn't always the rigorous, objective search for knowledge it's supposed to be. Editors of medical journals, embarrassed by the quality of the articles they were publishing, began to turn the lens of science on their profession decades ago, creating a new field now named "journalology". (Enserink, 2018).

This section presents an overview of the dynamics of the elements in Figure 2. in terms of the Scientific Journal Index global structure related to the commoditization of scientific production.

Figure 2. Introduction conceptual map



The eagerness to comply with international standards and ranking systems has prompted Publindex, the Colombian scientific journal index and policy mechanism, to adopt

policy changes that have forced university governance to redefine their research and publication agendas. In light of these national and institutional demands, the involved actors have been compelled to find ways to cope with pressures related to internationalization processes to avoid affecting the quality, ethic, visibility, relevance, autonomy, and sustainability of national knowledge production incentives and evaluation mechanisms while preventing undesirable ethical behaviour in the epistemic communities and the national scientific and journal production systems.

International rankings have focused mainly on research measuring indicators based on citation evaluation in Elsevier's Scopus and Web of Science's (WoS) Clarivate databases (See Annex 1). This logic has led national policymakers to rethink their research evaluation models to comply with international standards, driving Publindex to modify its evaluation model according to these journals' indexing indicators. In response, universities have prioritized publication in these international systems' indexed journals and adjusted their research incentive policies accordingly. However, these policy changes have generated tensions involving internationalization, research indicators as starting point incentives for design, evaluation mechanisms, epistemic communities, research agenda autonomy, and ethical behaviour that upset decades-long developing national models, affecting research institutions, actors, researchers, and editors.

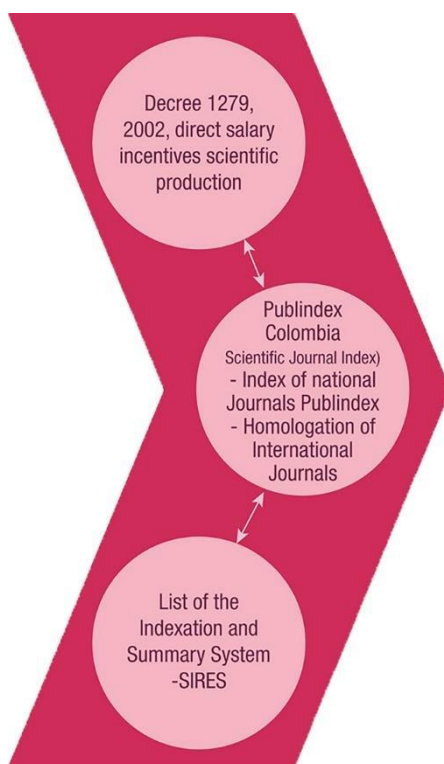
This doctoral dissertation looks at this highly discussed issue, favouring a bottom-up approach, based on the premise that understanding these tensions' effects and determining the factors that should be emphasized to alleviate them requires examining the actors' and institutional perspectives. Thus, this study aims to understand the current scholarly and policy debates of actors and institutions involved in scientific journal publication and university research governance to determine how they manage and respond to the tensions created by Publindex and propose focus points for their mitigation.

The following section provides a background that sets the backdrop in which this study is contextualized. It explains the global "business" of scientific journal publishing and its development in Latin America and Colombia, influencing the Colombian scientific journal index and policy mechanism, Publindex. Finally, it describes Publindex and establishes its most significant events on a timeline, which is the backbone of this study.

## 1.1. BACKGROUND

In Colombia, the development of the “business” of scientific journal publishing has generated changes in Publindex. Figure 3 shows three of Publindex’s leading events that set the background decree 1279 related to direct salary incentive through scientific production; Publindex index scientific production that finally categorizes national and international scientific journals; and the SIRES list indexation and summary system approved in the Colombian context.

Figure 3. Background conceptual map



From a global perspective, the “business” of scientific journal publishing has been marked by the dominance of large corporations. Their products have contributed to the development of editorial and scientific quality standards. They have generated new knowledge dissemination and circulation models (Moed, 2017), affecting the selection, production, and distribution of scientific research outputs worldwide. Their bibliometric-based database products, which use the profit-making market’s logic, have made the visualization of scientific production patterns by discipline, institution, and country possible.

They have become an evaluation instrument for multinational organizations to generate rankings, standards, and scientific policies related to quality and internationalization metrics (Glänzel, 2003). Thus, making the database both a tool and a resource for evaluating and the international dissemination of research.

In recent decades, the arrival and dominance of large corporations like Elsevier<sup>1</sup> with its Scopus<sup>2</sup> product and Clarivate<sup>3</sup> with its Web of Science<sup>4</sup> products have prompted changes in scientific journal publishing that have influenced global and local scientific production ecosystems and promoted the commodification of scientific production.

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<sup>1</sup> **Elsevier** is a global information analytics business that helps institutions and professionals progress science, advance healthcare, and improve performance. <https://www.elsevier.com>. “**Elsevier** (Dutch: [ˈɛlzəviːr]) is a Netherlands-based publishing company specializing in scientific, technical, and medical content. It is a part of the RELX Group, known until 2015 as Reed Elsevier. Its products include journals, the Science Direct collection of electronic journals, the *Trends* and *Current Opinion* series of journals, the online citation database Scopus, the SciVal tool for measuring research performance. Elsevier’s products and services also include digital tools for data management, instruction, research analytics, and assessment. Elsevier publishes more than 500,000 articles annually in 2,500 journals. Its archives contain over 17 million documents and 40,000 eBooks. Total yearly downloads amount to more than 1 billion. Elsevier’s high operating profit margins (37% in 2018) and £950 million in profits, often on publicly funded research works and its copyright practices, have subjected it to criticism by researchers. Seen as generating massive profits off of copyrights while adding little to no value to their products, Elsevier is commonly accused of rent-seeking.” (Wikipedia, 2021).

<sup>2</sup> Scopus uniquely combines a comprehensive, expertly curated abstract and citation database with enriched data and linked scholarly literature across various disciplines. Scopus quickly finds relevant and authoritative research, identifies experts, and provides access to reliable data, metrics, and analytical tools. Be confident in progressing research, teaching or research direction and priorities — all from one database and with one subscription. <https://www.elsevier.com/solutions/scopus>

<sup>3</sup> **Clarivate** is a global leader in providing trusted insights and analytics. <https://clarivate.com/>. “**Clarivate** is a company formed in 2016, following the acquisition of Thomson Reuters’ Intellectual Property and Science Business by Onex Corporation and Baring Private Equity Asia. On May 13, 2019, Clarivate merged with Churchill Capital Corp and was publicly listed on the New York Stock Exchange with the ticker symbol CCC. In an effort to improve its brand recognition, the company announced it would transition its stock symbol to NYSE: CLVT beginning February 1, 2021. Clarivate owns and operates a collection of subscription-based services focused largely on analytics, including scientific and academic research, patent intelligence and compliance standards, pharmaceutical, and biotech intelligence trademark, domain and brand protection. The services include Web of Science, Cortellis, CPAglobal, Derwent, Derwent World Patents Index, CompuMark, MarkMonitor, Techstreet, Publons, EndNote, Kopernio, and ScholarOne.” (Wikipedia, 2021)

<sup>4</sup> The Web of Science, owned by the company Clarivate Analytics, is the collection of bibliographic reference and citation databases of periodicals from 1900 to the present day. The WoS is made up of the Core Collection, which includes the Science, Social Sciences and Arts and Humanities indexes, as well as the Proceedings of both Science and Social Sciences and Humanities, together with the tools for analysis and evaluation, such as the Journal Citation Report and Essential Science Indicators. <https://www.recursoscientificos.fecyt.es/licencias/productos-contratados/wos>

According to Willmot (1995), the “commodification of academic labour and the managerial control of academic work results from political-economic pressures to demonstrate that funds are being directed in ways that are ostensibly congruent with the commodifying logic and priorities of capitalism.” (p. 993)

Studies such as Kang (2009) have addressed international vs. local knowledge tensions, maintaining that global competition has created a discrepancy between the knowledge produced and the local society’s needs. Similarly, studies on specific country case studies like Chou’s (2013) have looked at the increasing competition in global university ranking and the resulting paradigm shift in academic governance.

This large corporation’s internationalization-driven demands press national policy changes, affecting university governance at all levels. They compel universities and journals to redefine their research agendas to others that do not necessarily correspond to local issues but align with those in developed countries, stripping them of their autonomy and affecting the actors involved. However, most existing studies use top-down approaches that disregard the most affected, the actors that must find ways to comply with these demands within a specific institutional or local setting (Chavarro-Bohórquez, 2016). These policy changes also carry profound and distinct ethical perils in terms of incentive-based production of knowledge that affect the behaviour of institutions, research groups, and researchers with aphorisms such as “publish or perish.”<sup>5</sup>

However, in some countries, compliance with these standards has created a cascading problem that begins with sometimes abstract and highly contested changes in the national policies governing the scientific journal publishing system. Given that, in many cases, these measures are not applicable in some countries, there have been reactions in various contexts worldwide. Four of the most notable instances of these efforts are the

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<sup>5</sup> “Publish or perish” is an aphorism describing the pressure to publish academic work in order to succeed in an academic career. Such institutional pressure is generally strongest at research universities.<sup>[4]</sup> Some researchers have identified the publish or perish environment as a contributing factor to the replication crisis.” [https://en.wikipedia.org/wiki/Publish\\_or\\_perish](https://en.wikipedia.org/wiki/Publish_or_perish)



DORA Declaration (2012) on Research Assessment<sup>6</sup>, Responsible metrics<sup>7</sup>, The Latin American Forum for Research Assessment (FOLEC)<sup>8</sup>, and the Leiden Manifesto (Hicks, Wouters, Waltman, de Rijcke, & Rafols, 2015), Metric Tide Report of the Independent Review of the Role of Metrics in Research Assessment and Management (Wilsdon, 2015). They seek to balance evaluating research following quantitative vs. qualitative and local vs. international criteria.

Before introducing these large corporations' international standards, they created regional market structures to produce scientific journals in Latin America and Colombia. The following section describes these markets, the scientific journal publishing in Latin America and Colombia.

### 1.1.1. Scientific journal publishing in Latin America and Colombia

This section describes the main features and *stakes* of the scientific journal landscape or market operating in Latin America and Colombia.

#### *Latin America*

In Latin America, scientific journals emerged within universities. Most countries created national indexing systems that focused on quality standards to improve each country's academic output. In 1998, the Scientific Electronic Library Online (SciELO) originated in Brazil. SciELO is a model of an electronic publishing cooperative of scientific journals on the Internet. Created the model to offer an efficient solution to ensure visibility and universal access to its scientific literature, contributing to overcoming the "lost science" phenomenon (SciELO, 2019).

In 2002, the scientific journal indexing system of Latin America and the Caribbean, Spain, and Portugal (Redalyc), directed to the Social Sciences, was created at the Universidad

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<sup>6</sup> <https://sfdora.org/read/>

<sup>7</sup> <https://responsiblemetrics.org/>

<sup>8</sup> <https://www.clacso.org/en/folec/>

Autónoma del Estado de México. These indexing systems were created in Latin America as open access repositories to provide a referencing system in several languages, like Spanish, English, and Portuguese.

SciELO and Redalyc were developed in Latin America with an open infrastructure. For twenty years, they have promoted open access movements, which according to Redalyc (2020), are “open globally to all journals that work for an inclusive, equitable, and sustainable science communication ecosystem.” Since 2019, Redalyc directed its efforts toward a non-profit publishing model to preserve scientific communication’s scholarly and open nature (known as a diamond open access model<sup>9</sup>) beyond Ibero-America. Other supporters of this movement include the AmeliCA project<sup>10</sup>.

There are two routes in open access. One involves publishing books or articles on the publisher’s platform (gold access). The other involves archiving versions on an open access repository. The diamond route “tries to bridge the gap between the green and gold models, as this model takes into account the two most critical aspects of both models: costs (Gold) and quality (Green). It is the only model that guarantees the sustainability of open access publishing” (Arevalo, 2019).

According to Tennant et al. (2019), for more than two decades, “a highly successful system of free-of-charge, open access publishing (for authors) has been in place” (p. 34) in Latin America (Tennant et al., 2019, p. 34). Furthermore, “The regional model for open access that has been instituted in Latin America supports knowledge as a public good in

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<sup>9</sup> Diamond open access is like gold, in that the article is immediately open access in the journal, and nobody has to pay to read it. However, in gold open access, the author (or their institution or funding agency) normally has to pay a publication fee to get the article published. In diamond open access, they don’t have to pay, so the process is completely free of charge to both authors and readers. See <http://www.jasonmkelly.com/2013/01/27/green-gold-and-diamond-a-short-primer-on-open-access/> (stack exchange, 2021)

<sup>10</sup> AmeliCA is a communication infrastructure for scholarly publishing and open science. Sustained cooperatively, this initiative focuses on a non-profit publishing model to preserve the scholarly and open nature of scientific communication. AmeliCA commenced as Open Knowledge for Latin America and the Global South. On August 2019, however, faced with a regional context where platforms, science national councils, academic institutions and part of the scholarly community look down on local publishing by being compliant with commercial publishers’ strategies, and in the presence of an international context where initiatives such as Plan S define open science as a route, AmeliCA and Redalyc took concerted action to strengthen the non-profit publishing model to preserve the scholarly and open nature of scientific communication —also known as diamond model— beyond the Global South. <http://amelica.org/>

the most direct way possible –by putting scholarly knowledge in the hands of the public on an unprecedented scale” (Alperin 2015, p. 117). In turn, Alperin & Fishman (2015) have stated that “Latin America is the most advanced region in the world when it comes to adopting open access to their scientific and scholarly journals, which, for the most part, are available in full-text on the Internet at no cost to either the reader or the author, significantly increasing the visibility and accessibility to scientific production in the region” (p. 11).

The most relevant international adhesion movements to open access initiatives are the Budapest Open Access Initiative Declaration, signed in February 2002, and the further Declarations of Bethesda and Berlin, signed in 2003. In Latin America, open-access platforms and movements like SciELO and Redalyc have significantly influenced scientific production and dissemination patterns. Conceived in the Global South for the Global South, they are recognized by various universities and organizations worldwide like CLACSO, the Latin American Social Sciences Council, established in 1967 to promote academic internationalization in Latin America and the Caribbean, UNESCO, and Universidad Carlos III, among others. However, despite these recognitions, these regional models have limited recognition by international research evaluation policies (Beigel, 2020).

This movement towards scientific production without economic or copyright restrictions entails one of the essential discussions between open access and paid or restricted access to knowledge (the former being the most common for databases and indexers), perhaps questioning the model’s sustainability.

### *Colombia*

The international demands and pressures on the national scientific journal and the university research systems appeared to legitimize the citation-based ranking of university research by national institutions like the Colombian Ministry of Science Technology and innovation (Ministerio de Ciencia, tecnología e Innovación in Spanish) in 2009. This ranking is based on the citation of scientific journals indexed in Elsevier’s Scopus database and Thomson Reuters/Clarivate Analytics’ Web of Science databases.

The Ministry of National Education (Ministerio de Educación Nacional) manages and oversees education-related human capital in Colombia. Quality in higher education is the National Council of Accreditation and its National Accreditation System (CNA in Spanish), created through Law 30/1992. According to Article 53 of the Law, its mission is to guarantee that tertiary education institutions “meet the highest quality requirements and attain their purposes and objectives” (Colombian Congress, 1992). See Annex 2. Overview higher education institutions Colombia.

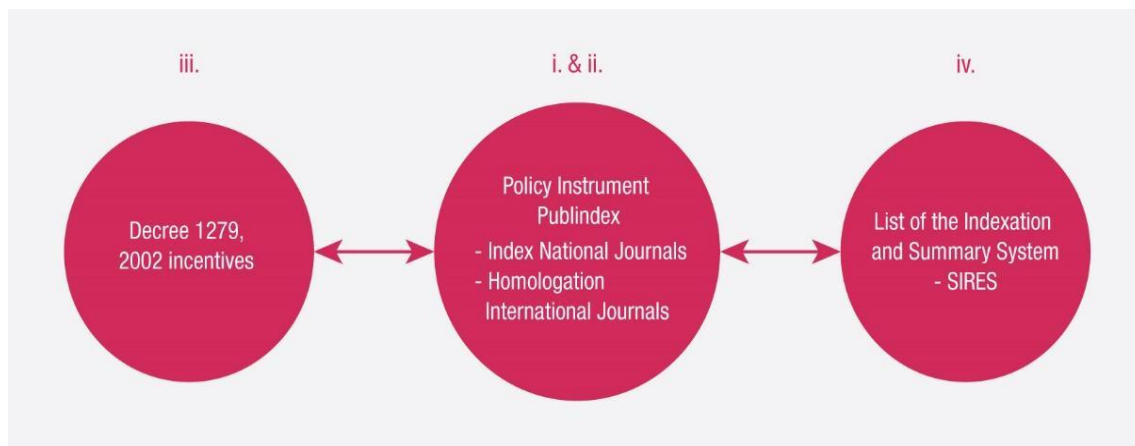
The Ministry of Science, Technology, and Innovation work closely with higher education institutions to promote scientific research and knowledge production policies. It provides funding for many scientific research projects conducted in universities and research institutions on a competitive basis and safeguards its funds. In the '90s, Minciencias introduced Publindex, the Colombian scientific journal index, and policy instrument.

### 1.1.2. Publindex – the Colombian scientific journal index and policy instrument

The Scientific Journal Index and Policy Instrument, Publindex, has played a relevant role in qualifying and improving national journals in Colombia. According to Delgado (2011), Publindex is seen as a successful policy that has evolved as new demands and issues emerge and has improved the quality of journals in Colombia. Evaluation of productivity uses Publindex as the standard in Colombia” (p.205). Since its establishment in 1994, the production and dissemination of scientific knowledge have undergone several stages, shifting from a national approach to one that seeks inclusivity in international databases. Its variables: measurements, incentives, performance, quality, visibility, accessibility, disciplines, social contributions, and geographical relevance have become the discussion of every Publindex-associated actor.

Four instruments make up the Publindex system. Figure 4 shows the relationship between the different instruments.

Figure 4. Scientific Journal Index and Policy Instruments Publindex.



Each of the instruments is described below.

- (i) A program for indexing the editorial and scientific quality of national journals, based on evaluation category classifications (A, B, C, D) to index the journals according to compliance with internationally recognized evaluation criteria for scientific publications related to the processes of editorial management, evaluation, visibility, and impact.
- (ii) A homologation program of international journals to national categories, carried out by Minciencias. It takes into account only the International Standard Serial Number (ISSN) included at the date of the revision in the Clarivate Web of Science's Journal Citation Report (JCR), Science Citation Index (SCI), or Social Sciences Citation Index (SSCI), and Elsevier's Scopus database-developed SCImago Journal & Country Rank (SJR) citation indexes, or the Index Medicus, PsycINFO, and Arts & Humanities Citation Index (A&HCI) bibliographic indexes. A list of approved journals, including ISSN, journal title, Minciencias-defined category, approval validation, and the Bibliographic Indexes Citations (IBC) or Bibliographic Indexes (IB), is issued. The validated foreign journals' homologation is valid for one year (January to December); its status can be extended or rejected.<sup>11</sup> The importance of the homologation of international journals lies in the categorization they receive

<sup>11</sup> <https://scienti.minciencias.gov.co/publindex/#/revistasHomologadas/buscador>

within the national system, which defines the salary points mainly for professors in public universities.

- (iii) Decree 1279 of June 19, 2002 (The salary and welfare regime for career professors of Colombian official universities) provides Colombian state university professors' salary and fringe benefits in Article 10, Academic Productivity. The salary scales are established based on scientific articles indexed, homologated, and acknowledged by Publindex-Minciencias.
- (iv) The Indexation and Summary System (SIREs in Spanish) defines the nationally endorsed scientific databases. This list specifies the Publindex-endorsed indexing systems for journal categorization. Publindex's associated program, SIREs, has a double function. On the one hand, it lists scientific journals in an indexing database classified by knowledge areas. On the other hand, it provides the criteria to approve scientific articles in Colombia. Historical cost-benefits analysis correlates the SIREs list and indexed journals, or approved journals, with salaries and research budgets. This decree directly links production with salary incentives and describes each product's academic performance rating, explicitly based on the publications in domestic or foreign journals included in Publindex and indexed in the SIREs summary systems. The SIREs list has been strongly influenced by the recognition of basic science databases rather than other disciplinary areas, generating a substantial imbalance in the approval of indexed and approved journals.

The following section provides a timeline of Publindex's most significant events, which situates the instruments mentioned above that make up its system and sets up the scenario to establish the problem statement.

### *1.1.2.1 Publindex timeline of most significant events*

As mentioned, this study follows a timeline of Publindex's most significant developments concerning the variables to assess knowledge production as its backbone. Figure 5 shows this timeline, highlighting the following significant developments involving the variables to assess researchers' knowledge production (See Annex 3, Journal Index in Publindex per institutions (1996 – 2014)):

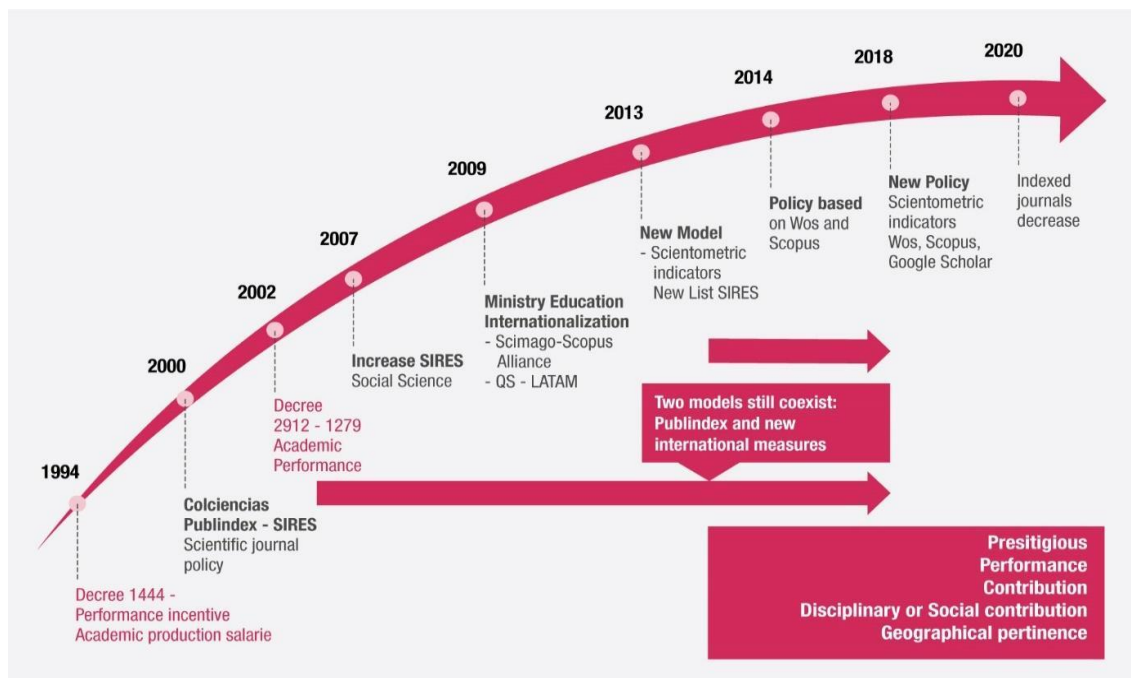
- (i) Decree 1444, knowledge production, the measurements of research articles in 1994;
- (ii) The creation of the national scientific journal index system, Publindex, the system indexing and abstract list in 2000;
- (iii) Decree 1279, which replaced decrees 2912 and 1444, established an academic performance rating for researchers based on scientific articles in the Publindex national system or homologation process with international journals in 2002;
- (iv) The Ministry of Education's development of a new research model in alliance with Scimago<sup>12</sup>-SCImago Journal Rank<sup>13</sup> and Scopus-Elsevier focused on analysing knowledge production and citations of universities, research centers, departments, and researchers in the Scopus database. Similarly, the new regional LATAM model of the QS ranking to measure knowledge production in terms of citation in the Web of Science database in 2009,
- (v) Publindex's model of evaluation of scientific journals using the scientometric citation indicators in 2013; and
- (vi) A model of measurements WoS and Scopus quartiles including (Google Scholar's H Index) in 2016.
- (vii) The consequence of the new journal indexing models was the disappearance or decrease of journals indexed in the Publindex system in 2018-2021. Denominated the killing journal era or the springs journal.

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<sup>12</sup> Its interface has been designed to access the bibliometric indicators database of the **SCImago** Journal & Country Rank portal. <https://www.scimagojr.com>

<sup>13</sup> In 2007, the SCImago research laboratory developed another scientometric indicator, the SCImago Journal Rank (SJR). This journal quality indicator uses Scopus indexed journals for quality assessment, applying the PageRank algorithm of the Scopus database, more complex than IF, which considers citations in Scopus database in a 3-year period (Ramin & Sarraf Shirazi, 2012; (Cantín & Muñoz, 2015).

Figure 5. Timeline Colombian Scientific Journal Index Publindex.



Decree 1444 of 1992 provided the first national demands involving the scientific journal and university research management in Colombia (Colombia P. d., 1992). Article 5, for Academic Productivity, established a points system to determine employees' monthly full-time compensation. All the individual teachers' points are added up and multiplied by the point's value. The points are recognized provided that the teachers recognize their affiliation to the university and credit or mention it in the scientific, technical, artistic, humanistic, and pedagogical production.

In 2000, a version of the national scientific journal index system, Publindex, was launched as an indexing system and abstract list, establishing criteria modified by subsequent developments. Along with this 2000 version, the need emerged in scientific societies to identify and store scientific publications to facilitate and improve their circulation and fulfil the need for remote access to documents and support institutional, national, and regional efforts to create document bases. Thus, the SIREs indexing and summarization service were established to promote the plans and programs to meet information flow needs. According to Minciencias (2017), these services "integrate the general information of the journals and their contents (continuous or partial)" (p. 1).



In 2002, Decree 2912 of 2001 replaced Decree 1444. This Decree's Article 7, Academic Productivity, defined the point scores and ceilings according to production. It states:

Teachers entering or re-entering the teaching profession are paid the academic productivity salary points according to the different academic modalities, their criteria, and their different ceilings. However, the allocation of points is global and determined by compliance with the provisions foreseen in numeral IV of this Article, which establishes the allocation of points by academic levels/titles. Literary production is taken into account without the requirement of credit or mention of the respective university.

Decree 1279 of June 19, 2002, determined the salary and fringe benefits for professors of Colombian state universities. In Article 10, Academic Productivity, the salary scales are set by indexing and homologating scientific articles by Publindex-Minciencias. According to Tobón et al. (2014):

Among the remuneration factors contemplated in Decree 1279 of 2002, the academic productivity category, in general, is the differentiating element of the professors' salaries because of the numerous concepts and flexibility in time to obtain the respective increase of points after being verified by the Internal Committee for the Assignment and Points Recognition and the Recognition Committee's verification of the quality requirements demanded in the norm. Furthermore, within the category of academic productivity, the publication of articles in specialized scientific journals stands out from the rest of the concepts that modify the professor's salary. (p. 181).

In 2009, striving towards internationalization, the Ministry of Education launched a new regional LATAM model of the QS ranking to measure knowledge production in terms of citation in the Web of Science database. Then, in 2013, Publindex presented a model to assess scientific journals. The ranking model was methodologically developed based on the quartile model, using the Q1, Q2, Q3, Q4 system to rank the articles published by each researcher based on the journal's quality. Finally, in 2016, it included the Journal Citation Report (JCR)<sup>14</sup>, SCImago Journal Rank (SJR), and Google Scholar H5 index<sup>15</sup> to assess the quality of journals and editorial boards.

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<sup>14</sup> InCites is a customized, *citation*-based research analytics tool on the Web that enables evaluating institutional productivity and benchmark output (Clarivate, 2021)

<sup>15</sup> "h5-index is the h-index for articles published in the last 5 complete years. It is the largest number h such that h articles published in 2007-2011 have at least h citations each [sic]" (Yale University Library, 2021).

Throughout Publindex's timeline, the influence of international databases in its measurement and evaluation modelling is notable. In the last decades, these international organizations have had a marked influence on Minciencias' Publindex policymakers to use these databases as a model to evaluate knowledge production of researches in the science and technology system. The principal players are the publishing corporations: Elsevier with their Scopus database, SCImago with SJR, and Clarivate with their database Web of Science, influencing national policy and the negotiations to purchase databases.

The following section describes the knowledge war between these corporate databases to corner the worldwide market for scientific production and their influence on Minciencias Publindex policymakers.

### 1.1.3. National Consortium for the Acquisition of Quality International Bibliographic Resources

The knowledge war began with Thomson Reuters' intellectual property and science unit sale to Onex Corporation and Baring Private Equity Asia, now Clarivate Analytics. Given Thomson Reuters' loss of the Latin American market since 2009, Minciencias created a consortium<sup>16</sup> with Scopus-Elsevier and other publishers as a strategy to purchase databases.

In 2018, negotiation for the consortia's renewal began. Universities and several organizations pressured Minciencias to create a coalition to negotiate the new database contract (Consortio, 2020) (Consortio Colombia, 2020). Elsevier and their Direct Science website decided to participate. Clarivate, however, agreed to deal independently with each institution. Responding to the competition posed by open access systems, Elsevier set out to increase the number of indexed scientific journals in Latin America and improve their low

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<sup>16</sup> The National Consortium for the Acquisition of Quality International Bibliographic Resources was led by the Colombian Association of Universities (ASCUN) and sponsored by the Ministries of Science and Technology and National Education. The consortium, made up of fifty-three (53) university institutions, is the first in the country's history with broad national participation and more than one international publishing house. Since 2019, they have worked together on a governance scheme, defining the content and establishing parameters for negotiation with publishers to access databases.

regional representation in these databases. Thus, Scopus –their database of peer-reviewed literature– began to purchase many open-access platforms.

Meanwhile, the consortia were exploring Article Processing Charges (APCs). APCs are one-time payments for authors to cover the costs of peer review administration and management, professional production of articles in PDF and other formats, and dissemination of published articles in various venues, in addition to other publishing functions<sup>17</sup>. According to Consorcio (2020), “The annual amount that goes to APC payment for publications has increased 15-fold: from almost USD 200 thousand invested in 2009 to USD 2.6 million in 2019. The increase in cost is susceptible to the growth of publications.” (p. 50).

A report by Vélez-Cuartas et al. (2020) “reported a clear exponential trend (gray line) in APC payments’ growth, reaching a total value of USD 10 million over ten years. In addition, the development of costs for publishing research results, in which Colombian institutions participate, has been 625% in the given period” (p. 49). It concluded that:

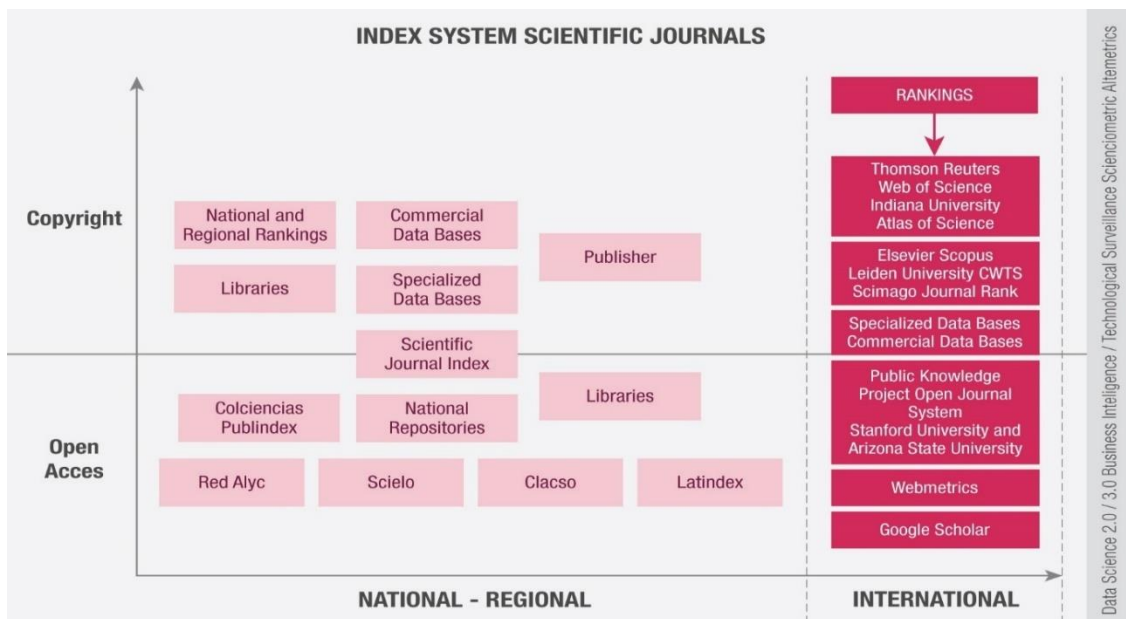
Two alternative scenarios can be proposed: a. Carry out own measurements to analyze the reality of open access in the regions specifying the payments of APC investments. With this, the institutions and governments will carry out particular visibility strategies according to their researchers’ production dynamics. b. Renegotiate with publishing companies to decrease the cost paid for the subscriptions and include what you have invested in APC in those trading packages. (p. 71)

The renewal of this consortia sets the landscape for journal indexing in Colombia. The significant influencers on Publindex’s national policy are publishing corporations like Elsevier with their Scopus database and Clarivate Web of Science. Figure 6 shows Colombia’s journal indexing system landscape in the copyright and open access arenas, including its national and international actors.

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<sup>17</sup> “There are no charges for rejected articles, no submission charges, and no surcharges based on the length of an article, figures, or supplementary data. Some items (editorials, corrections, addendums, retractions, comments, etc.) are published free of charge.” <https://www.mdpi.com/apc> (publishing, 2020)

Figure 6. Scientific journal index system in Colombia



As shown in the figure, both the national (Publindex) and the international ranking models are on the scene, generating governance constraints to research issues (Jansen, 2007) that universities must manage. The system's pressure has affected researchers' behaviour to perform and become legitimate. Implementing these models has created tensions between the national capacities and processes of knowledge construction and the international evaluation mechanisms of scientific journals and standards. These tensions are generally produced by changes in policy that aim to satisfy international demands but fail to consider the national interests and institutional capabilities (See Annex 4, Multilevel actors, stakeholder).

At the national level, the efforts to comply with these demands for standardization are initially evident in the perplexity of the policies regarding scientific journals in Colombia. Their discontinuity, ambiguity, and lack of coordination produce a perception of the non-existence of a "system." These tensions are further detailed in the following problem statement within the context of the timeline presented in this section.



## **2. PROBLEM STATEMENT**

## 2. PROBLEM STATEMENT

This section looks at the pressures of internationalization-driven demands influenced by actors and instruments such as corporations, rankings, and indicators. It examines the sources concerning international vs. national or disciplinary dynamics surrounding scientific journals in the scientific and scholarly communication contexts that compel policy changes affecting regional university governance and actors. Ultimately, it aims to establish the tensions produced by these pressures. The section first looks at internationalization-based demands on a global scale, then the sources of tensions generated by Publindex's policy changes on the national university research systems.

### 2.1. The “business - market” of journal publishing-derived tensions on university research systems

The global corporations' introduction of international standards and ranking systems has created tensions that pressure university governance to redefine their incentives through research indicators, research agendas, disregarding national and institutional realities and compelling the actors involved to find ways to comply with these demands. In some cases, these pressures promote undesired behaviour that adversely affects the quality of the scientific output.

#### *Internationalization*

Many studies on international vs. local knowledge dissemination have been conducted in specific studies involving country or disciplinary analysis. Country case studies, such as Chou's (2014), have shown that the increasing importance of competition in global university ranking has resulted in a paradigm shift in academic governance. Many governments have introduced different strategies for benchmarking their leading universities to facilitate global competitiveness and international visibility. A significant trend in changing university governance is the emergence of a regulatory evaluation scheme for faculty research productivity, reflected by the striking features of the recent changing academic profile of publication norms and forms beyond nation-states' territories.

In a similar line, Logan et al. (2019) found that global competition has created a discrepancy between the knowledge produced and local society's needs. Their study examined how the reform policies for international competition surrounding Social Science Citation Index (SSCI) journals' emphasis might create globally competitive and perhaps locally unsuitable knowledge to support these assertions. The study found a disjoint relationship between the research sphere's knowledge and the local society's needs.

Local researchers are compelled to adopt mainstream theoretical frameworks of North America and Europe to publish in indexed journals (Chavarro-Bohórquez, 2016). As a result, local issues and problematics are subsequently neglected and relegated to the margins of pertinent academic research interests. However, internationalization *per se* can be achieved in post-colonial ways and encourage scholars and practitioners to concern themselves (Tadaki, 2013).

In this internationalization scenario, research performance is assessed in terms of the number of articles published in WoS indexed journals based on the citation rates and associated factors in the Science Citation Index (SCI), the Social Science Citation Index (SSCI), and the Arts and Humanities Citation Index (A&HCI) of citation (Moed, 2017). However, this emphasis on SSCI, SCI, and A&HCI publication statistics has two adverse effects. "First, colleges and universities compete in recruiting scholars with many publications, thus creating a false high academic achievement. Second, universities develop policies encouraging the faculty to contribute to English-language journals, incurring The hegemony of the English language. This language supremacy requires a paradigm shift of the local academic communities, faced with academic discrimination because of locality, which is demonstrated, for example, by the Social Science Citation Index (SSCI) syndrome in Higher Education by degrading local journals and accelerating academic stratification" (p. 12). Therefore, professors who publish, for example, in Chinese may be regarded as second-tier scholars. This severity has recently intensified with the emergence of a vicious cycle related to research productivity, teacher education, preparation, and overall quality (Lai, 2004; Tzi Sin et al., 2013).

Other issues related to internationalization efforts include collaboration. For instance, as observed in the co-authorship of journal articles written by local scientists and partners located overseas affects research teams' ability to produce bibliographic outputs and contribute to local knowledge (Corengia et al., 2018; Ordóñez-Matamoros et al., 2010, 2020).

Some theoretical and methodological responses have been developed on a global scale. The Altmetrics Manifesto (Priem, 2010), the DORA San Francisco Declaration on Research Assessment (Annual Meeting of The American Society for Cell Biology, 2012), the Responsible Metrics Evaluation for Open Science European Union (Wilsdon, 2017), the Valencia Manual-the Iberoamerican Manual of Indicators of University Linkages with the Socioeconomic Environment (Albornoz et al., 2017), the CLACSO-LATAM Social Science Manifesto (2017), the Measures for Management of Scientific Data Regulation, Data Sovereignty (Jing & Yin, 2018), the OPERA's Declaration on the Plan S European Union (2018)<sup>18</sup>, and the Open Access Declaration of Panama (2018)<sup>19</sup> are among the motions addressing these international standard demands.

This literature review clearly shows the reality of the conflict between internationalization demands and their integration into regional systems with particular contexts, capacities, and capabilities. Yet, the efforts to manage these international pressures are left to the national actors that must comply with these demands amid their institutional and national realities.

The following section looks specifically at the sources of pressure derived from these internalization-driven pressures on the Publindex policy in Colombia within the timeline presented in the previous section.

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<sup>18</sup> Plan S is an initiative for Open Access publishing that was launched in September 2018. The plan is supported by the S coalition, an international consortium of research funding and performing organizations. Plan S requires that, from 2021, scientific publications that result from research funded by public grants must be published in open access journals or platforms. <https://www.coalition-s.org/>

<sup>19</sup> [https://hiperderecho.org/wp-content/uploads/2018/11/declaracion\\_panama\\_ciencia\\_abierta.pdf](https://hiperderecho.org/wp-content/uploads/2018/11/declaracion_panama_ciencia_abierta.pdf)



## 2.2. Publindex-derived tensions within its timeline

A general statement can be made that internalization has also affected Colombia. As Wouters (1999) states in his doctoral thesis, the global logic of scientific production has created a citation culture. However, the Latin American context has maintained open access in repositories and Social Science associations. Thus, how the evaluation systems seek to assess using the ISI citation culture does not reflect the Latin American and Colombian scientific productions. According to Derek J. de Solla Price (1963), *Little science, big science-and beyond*, discusses science and its place in society, the changing role of scientific publications, and the evolution of scientific organizations.

To comply with the requirements of the so-called “big science,” Publindex has implemented this model in national research, specifically. It considers citation in databases as WoS and Scopus as the leading indicators to determine ranking and evaluation mechanism to assess journals. However, this model presents issues in developing countries like Colombia, creating tensions among the scientific journal publishing community. Its conflict with the local and institutional contexts brings the policy’s efficacy and legitimacy into question. What is the policy’s scope? To whom is it directed? Does it address international standards, disregarding national and institutional particularities?

The Publindex program’s continuity has come into the debate since 2015. In response to the assessment model presented in 2013, researchers from different disciplines complained about its logic and rationale concerning the measurement models based on the level of citations of the journals indexed by the Web of Science and Scopus databases. As a result, SCImago Journal & Country Rank proposed a national citation database model using the Publindex program. Other experts have considered eliminating this assessment method, arguing that international systems, such as the publisher databases, leverage this process.

The problem of implementing this WoS and Scopus-based assessment model even extends to the SIREs system. Despite these corporate journal indexation systems’ (JIS)

limited regional and national scientific production coverage, it categorizes the Web of Science and Scopus databases above the rest. Besides affecting the number and category of indexed and approved journals, according to Article 10 of Decree 1279, the SIREs list influences the salary points of public university professors and the incentive models and professional growth in private universities. According to Delgado, “The growth of journals in Colombia is associated with the university salary systems. Public university salaries reward productivity through salary increases, and private institutions mainly through one-time bonuses” (2011, p. 205).

In 2018, Publindex presented a model to assess scientific journals, research institutions’ teams, and researchers based on the citation and quartile model. The ranking of articles by the citation level in the Web of Science and Scopus databases was again questioned. It lowered the existing rankings of the national science and technology system, decreasing the number of scientific journals indexed in the Publindex system. The systemic effect on the research institutions, teams, and researchers’ rankings and classifications rejected this new categorization model.

The desire to be indexed augmented the number of journals in Colombia; 541 journals were created in the last two decades. However, with the model change from 2014 to 2021, 295 journals disappeared from the Publindex indexing system (Figure 7). According to the literature, “the total number of national scientific journals by 2015 was 541 journals indexed in Minciencias’ system. In terms of the internationalization process, national journals indexed in the international system like Elsevier and Scopus, 22 Colombian journals comply with international evaluation measurement systems” (Molina & Moya, 2013, p. 532) in 2013. In 2020, there were 275 journals indexed. Since 2015, about 55% of the journals have disappeared. Editors have called this the “Journal Homicide or Epistemicide or Journal killing era.” as referenced at the publishers’ conference in Cali Colombia 2016. See Annex 5. See Annex 3. Journal Index in Publindex by Institution (1996 – 2020).

Figure 7. Colombian Journals index in Publindex 1996 - 2020

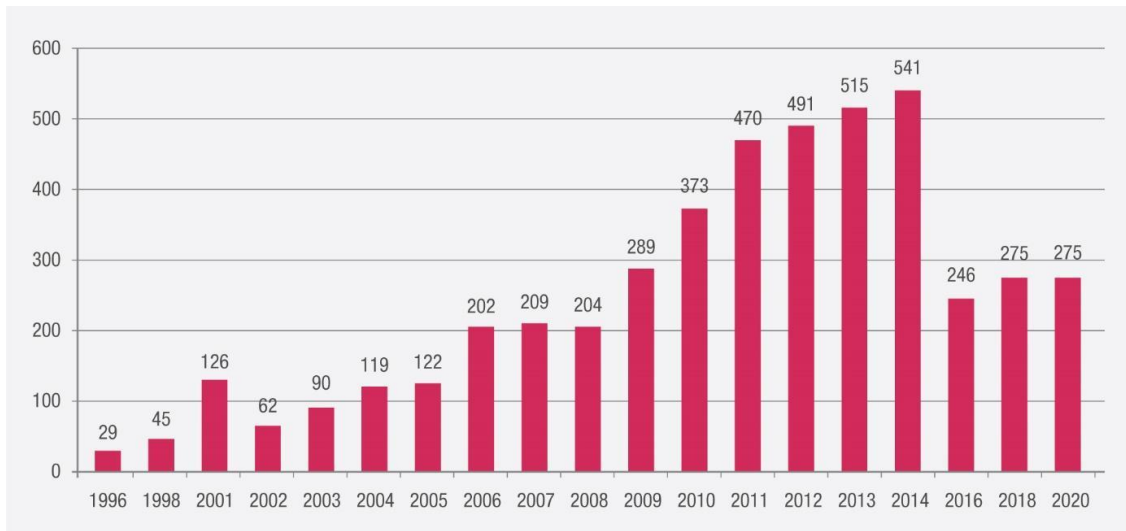


Figure 8 provides insight on the proportion of journals affected resulting from the change in the measurement model, which only recognized the spurious measure of the impact factor as the only valid measure despite the ongoing –without being controversial– arguments presented publicly by the scientific directives of the “governing” entity of science or the “scientific” university directives.

This infographic illustrates the difference between the last (second) update in 2014, the last measurement before the change, and the results published by Minciencias and presented publicly in October 2017 in the original infographic, which the institution removed from the public domain.

Figure 8. Publindex results 2018, cartoon



Source: Mamados de Minciencias. Yury Jack Gómez Morales.  
[https://www.academia.edu/35083336/Reporte\\_Publindex\\_Alternativo?email\\_work\\_card=abstract-read-more](https://www.academia.edu/35083336/Reporte_Publindex_Alternativo?email_work_card=abstract-read-more) (2011).

The model’s sustainability is also under discussion in Colombia. As Tejada-Gomez (2012) points out:

If we were to think about the budgets spent in Colombia in journals –proofreading, layout, printing processes, and web pages– we would have to consider a profound reflection on the national model. The topic of commercial guidelines, personal and organizational subscriptions, charge for publishing articles, purchase of articles online, distribution, exchange of guidelines, management of budgets and costs, economic models; unquestionably, this is a topic to explore and consolidate. (p. 110)

Seemingly, Colombia's scientific policy has homogenized the communities, overlooking each discipline's particularities and the local context. According to Delgado (2011):

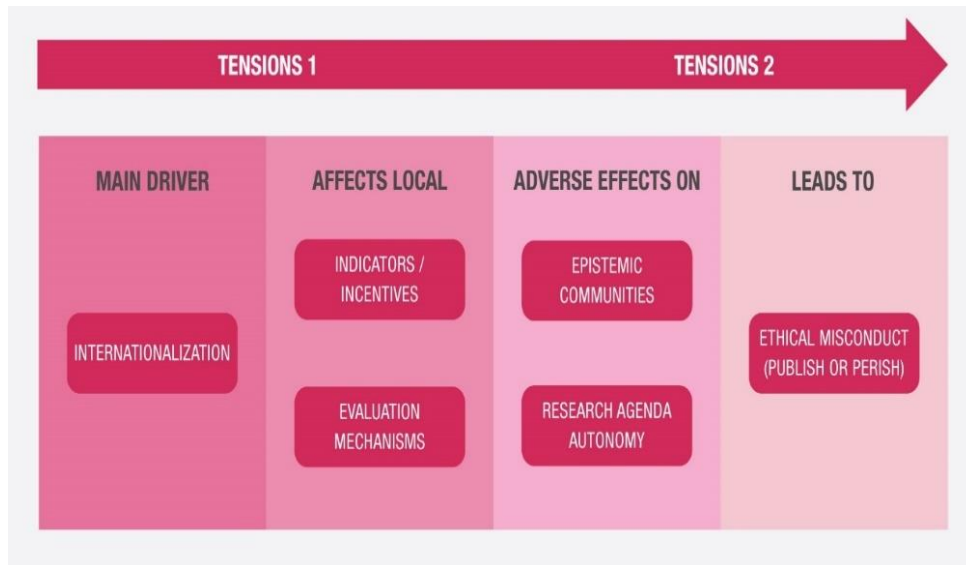
Even though journals have considerably advanced in the last two decades, some areas of tension have emerged. In general, they are associated with the imposition of a publication model based on research tradition from the primary and natural sciences, presses to increase exogamy of publications, and maintain language barriers. (p. 215)

These issues, driven mainly by internationalization demands and produced by the eagerness to comply with international standards and ranking systems, are the sources of the tensions addressed in this thesis.

These tensions result from the distillation of the issues described above, which have prompted Publindex, the Colombian scientific journal index, and policy mechanism to implement policy changes, forcing university governance to redefine their research and publication agendas for the involved actors. As a result, they are left to find ways to cope with these tensions to avoid affecting the quality, visibility, accessibility, relevance, and sustainability of national knowledge production and preventing undesirable behaviour in the national scientific and journal production systems while complying with these national and institutional demands.

Figure 9 shows the interaction of the tensions to understand the dynamics. Although they are presented as two tensions (Tension 1 and 2), they are not independent. Instead, they have a cause-and-effect interaction, internationalization being the main driver.

Figure 9. Tensions and their interaction



The evidence presented of the problem's existence through this literature review on scientific journal policy, followed by an additional review guided by the tensions presented here, exposes the issue and leads to the study's objective and research question.

### 2.3. Purpose Statement

The eagerness to comply with international standards and ranking systems has prompted the Scientific Journal Index and Policy Instrument, Publindex, to implement policy changes that force university governance to redefine their research and publication agendas. Thus, creating tensions that the involved actors must address in the light of national and institutional constraints. Finding ways to cope with these tensions is paramount to avoid affecting the quality, visibility, accessibility, relevance, and sustainability of national knowledge and preventing undesirable behaviour in the national scientific and journal production systems. This study sets out to answer the question:

*How do university research governance actors respond to the internationalization-driven tensions and Publindex's policy changes and determine the points that should be emphasized to alleviate them?*

This study aims to understand better how the actors involved in university research governance and national scientific journal publication respond to the tensions produced by Publindex to comply with international standards. This study is driven by the premise that understanding these tensions' effects requires listening to the voices of the university research actors who must comply with these demands while considering national and institutional particularities.



### **3. LITERATURE REVIEW**



### 3. LITERATURE REVIEW

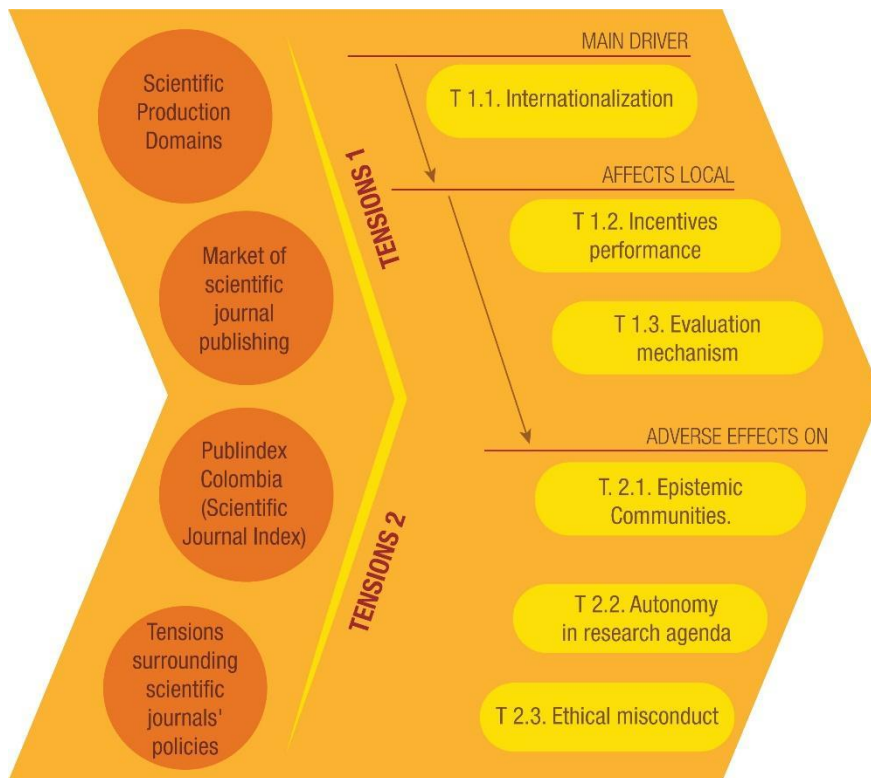
“Meta-research is an evolving scientific discipline that aims to evaluate and improve research practices. It includes thematic methods, reporting, reproducibility, evaluation, and incentives (how to do, report, verify, correct, and reward Science)” (Ioannidis, Fanelli, Drake Dunne, & Goodman, 2015).

The literature review was carried out in several phases. In the first part, a search was carried out using the concept of scientific production, which identified the main domains in which the subject was discussed. In the second phase, a literature review was conducted on the journal publishing market, understanding the industry's dynamics and tensions. Finally, in the third phase, I delved into the literature of the Colombian national indexing system Publindex, which gives context to the country's specific discussions concerning the tensions that arise from the journal publishing market.

The literature review was carried out through multi-source analysis using Web of Science, Scopus, Google Scholar through Publish or perish, Red Alyc, SciELO, and local repositories, which made it possible to recover information from the Colombian national context, Latin American regional context, and literature from international databases; this made it possible to broaden the spectrum of information analysis with literature that is not found in international databases.

Finally, the literature analysed above allows us to identify the tensions surrounding scientific journal publishing. A literature review of each of the tensions is carried out, where a common thread is identified. Tension 1. Internationalization, incentives, and evaluation mechanisms are the main drivers of internationalization, which the indicators have defined as an incentive in the performance of research. The central gap is found in the evaluation mechanisms. Tension 2. Epistemic communities, autonomy in the Research agenda, and ethical misconduct have been impacted with adverse effects. Below is the literature review based on the conceptual map in Figure 10.

Figure 10. Literature Review conceptual map.



This section provides a general review of the literature concerning the domains that analyze scientific production. Next, it analyses the literature related to the “business market” of scientific journal publishing, where the international standards affect university governance. Finally, the third section carries out a literature review based on the two previous ones, deepening the tensions surrounding scientific journals policies, namely internationalization, Indicators as starting point incentives design for scientific production, evaluation mechanism, epistemic communities, autonomy in research agenda, and ethical misconduct. The main intention is to identify “tensions” through this state of literature report.

### 3.1. Scientific Journal Publindex Policy in Colombia

In its beginnings, Publindex's implementation was *supported* by the Colombian Science and Technology Observatory (OCyT). According to Charum (2004), this support responded to

“the need for a bibliographic base to select journals using quality criteria. Furthermore, it constitutes the available memory of the results that circulate through them and allows for elaborating representations of the national scientific production, designed in the National Indexing System Publindex”. (p. 301)

In the same article, Charum mentioned that the support also fulfilled:

the purpose of the national policy of science and technology is to have a national bibliographic index that:

- a) Serves to guide policies for the promotion and support of national publishing capacities to support journals, their editors, and publishing bodies to meet publication needs in the different areas of science and technology;
- b) Makes it possible to obtain a representation of national production circulating in national journals and establish their quality levels;
- c) Becomes the reference for the qualities that serial publications should have and the conditions that should be met to ensure their broader circulation and integration into international indexing and summary services;
- d) Acts as the national bibliographic base that preserves, through permanent inputs, the structured memory of the production of research results disseminated in national journals, making it publicly available to all interested parties, thus, increasing its visibility and accessibility;
- e) It is conceived as an information subsystem where information circulates to and from the other information subsystems of the national science and technology system. (p. 298).

However, Publindex has fallen short in achieving the points described by Charum (2004). Specifically, points c, d, and e, have been unsuccessful at becoming a bibliographic *database* that increases visibility and accessibility to the extent that some of the interviewed

actors expressed that it is better to index in international *platforms* than the Publindex national system. As (Pineda and Jaramillo, 2002) mention, “Problems of access to knowledge faced by researchers from developing countries are related to neo-mercantilist policies of developed countries concerning scientific information also to the social dynamics surrounding scientific activities in the own countries.” (p. 138).

Several research studies and articles have been carried out on scientific production and the Publindex indexing system in the Colombian context. For instance, Chavarro’s (2016) doctoral dissertation studied the importance of local journals, and Delgado (2011) analysed university policies to promote the publication of journals comparing three countries with journal evaluation systems, which have been linked to faculty incentives and promotion.

Among the issues discussed in the different studies is standardization driven by compliance with international standards. As Guédon points out, “This leads to an evaluation not of the quality of the country’s literary production but its capacity to enter into forms of socialization of knowledge imposed from standards of so-called mainstream science” (as characterized by Guédon, 2019), making local knowledge production susceptible to the measurements established by commercial entities of knowledge. According to Vargas (2008) goes on to explain: “Colombian academics, because of the nature of our scientific concerns (local or regional), our audience (also local or regional), and our language (Spanish or Portuguese), are not necessarily committed to the fulfilment of exogenous quality standards. Furthermore, Rodríguez Morales et al. (2014) suggest that “we conclude that the classification of Publindex is not consistent with the impact indicators of Colombian journals: Google Scholar Measure (GSM), Scopus, and SciELO” (p. 32). As a result, this system does not allow all publications to be treated equally. Therefore, it does not constitute an efficient system of incentives.

Some of the main dilemmas are found in the relationship between Publindex indexing and the salary incentives provided by Decree 1279. Three significant conditions have favoured the growth of journals in Colombia: faculty salaries, Publindex, and university/program accreditation. However, these conditions are linked to metric indicators of international corporations that ignore the local reality and the particularities of the areas

of knowledge. In his study, Delgado stated that “understanding how the Colombian university accreditation system relates to the publication of scholarly/scientific journals” (2011, p. 31).

In this regard, Decree 1279 should rethink the evaluation mechanism in terms of research incentives. The Colombian salary system for faculty in public universities is different from most Latin American and Caribbean (LA&C) countries. In Colombia, accreditation is voluntary and a factor of competition and prestige. Furthermore, the models of knowledge production are developed under a logic different from those of mainstream science, where the publishers and sponsors of scientific journals are universities rather than associations or publishing companies. According to (Gómez et al., 1998), “A future scenario for Colombian research serials could be one in which research could be one in which the concentration of efforts and resources, the minimization of production costs and the maximization of quality, as a condition, the creation of formulas for of partnership and cooperation between publishers and institutions, taking advantage of the opportunities offered by existing book laws, and a potential merger or disappearance of titles. The latter will be determined by the evolution and growth of the different scientific, academic communities and their communicative practices”. (p. 213).

The following section summarizes knowledge from various epistemological perspectives concerning the domains that analyze scientific production.

### 3.2. General Literature

The concept of scientific journal index policy was used in the literature review to understand the pressures and tensions behind *scientific* production. This term is frequently analysed from the sociology of science, philosophy of science, scientific communication studies, policy studies, history of science, science technology, and society, evaluation science, computer science, comparative education studies, higher education, research management, technology, and innovation, information science, or interdisciplinary combinations.

The bibliometric analyses by Rijcke and Wouters et al. (2016) highlight some domains to approaching the problem from the governance perspective, including the rise of accountability and indicators such as tools to further competition, the science-policy perspective (formal mechanisms of evaluation), and the sociology of science perspective (cultural critiques of assessments and indicators, dynamics of science).

The first approach to the literature review was an overview of the discussion. Its execution was based on the concepts of governance, university governance, university research governance, and scholarly output in higher education, including scientific policy and institutionalism and their relationship to scientific publications systems in the context of scientific communication and research evaluation.

The domains analysed in this first approach are presented in Table 1, including some critical research questions analysed in different studies, followed by the summarized findings in each domain, which outline the literature review.

Table 1. Disciplinary Domains, Scientific journal indexing policy

GOVERNANCE			SCHOLARLY OUTPUT					
	Institutionalism		Organizational pressure	Higher Education	Scientific Communication	Sociology of Science	Ethic / Philosophy of Science	Research Evaluation
Concepts	Regulative, normative and cognitive.	Stakeholders, structures and governance.	External and Internal.	Incentives extrinsic and intrinsic.	Visibility, accessibility, quality, internationalization.	Invisible colleague, epistemic or disciplinary contribution.	Responsible behaviour, ethics. Plagiarism, salami slicing, Harking.	Scientometric, bibliometric (information science).
	Complexity.	New Public Management.	Institutional Homogenizations.	Incentives / Performance.	International vs. local contributions.	Epistemic.	Plagius, salami slicing, black market citations.	Altemetrics.
Question in the Literature	How occupational groups, such as academics, struggle to secure a degree of self regulation over their work in the face of pressures to replace the traditional ethic of collegiality with that of managerialism?	Positive learning vs. Perverse learning / dysfunctional behavioural effects in academia. Such strategies very often include behaviour such as manipulating data and faking information (Jaworski and Young 1992, p 17). How have this changes affected academic social science? How the new governance logic affects the work behaviour of scholar?	This effect is referred to as a "tunnel vision" (Smith 1993, p. 144; 1995, p. 284). The wellknown accounting researcher Merchant (2012, p. 116) has claimed this to be a tendency towards homogenization hindering creativity and innovation. In a special section doing research on the governance of accounting academia, Khalifa and Quattrone (2008) have noticed a commodification of knowledge and attested that academics draw more attention to exterior packaging.	The competition to publish and perish generated unethical conduct in the academic scenarios as authorship, publish the same material in different journals and languages. How do the institutions / journals prevent this behaviour?	Low international recognition of their accomplishments (Gevers, 2009). Local vs. International recognition, measures, indicators, ethics, quality (e.g., creativity, originality).	The disciplinary difference in terms of channel of communication and legitimation changes depend on the methods and ways to publish, (Merton, Crane).	The measures system generates perversion in the system and also power for specific journals, press corporations or disciplines who create like a mafia in specific communities or invisible colleges who manipulate citation and articles to publish (black market of citation or the law of friend cites friends).	Positive or negative citation without quality distinction generates scientometric indicators to measure authors, institutions and journals. Do you consider that the negative citation will be contrasted with other methods as peer reviews, to define the prizes, salaries or other incentives in the organizations?

Source: Created by author, based on the following Crane (1972), Gevers (2009), Jaworski & Young (1992), Khalifa and Quattrone (2008), Merchant (2010, p. 116), Merton (1973), Powell (1985), and Smith (1993, p. 144; 1995, p. 284)

Concerning the governance domain, the first is **Institutionalism**, related to regulative, normative, and cognitive organizational structures. In the literature review, the questions arose were “How do occupational groups, such as academics, struggle to secure a degree of self-regulation over their work in the face of pressures?” (Clemens et al., 1995; Scott, 2004). The term, New Public Management appears related to stakeholders, structures, and governance, guided by the question, “How does the new governance logic affect the scholar’s work behaviour? (Jaworski & Young, 1992). The increased literature on the effects of new public management in higher education has led to some fundamental reflections regarding standardizing management logic without understanding the institutional contexts.

The second concept under governance is **Organizational pressure** from external and internal tensions; the effect is a “tunnel vision” (Smith, 1993, p. 144; 1995, p. 284). The well-known accounting researcher Merchant (2010) claims that homogenization hinders creativity and innovation (p. 116). A special section researching the governance of academic accounting noted a commodification of knowledge and indicated that academics draw more attention to exterior packaging (Khalifa & Quattrone, 2008). The literature concerning organizational pressures describes homogenization due to ranking or accounting models, which are more related to a focus on product outputs, such as journal articles, rather than on research processes and different modes of knowledge production.

The literature review frames Scholarly Communication from different disciplines. **Higher Education** is related to extrinsic and intrinsic incentives for research performance (Tadaki, 2013) and institutional logics impact (Cinar & Benneworth, 2020). The literature discusses the competition to publish or perish, which has generated unethical conduct in academic scenarios like authorship and recycling in different journals and languages.

The second concept under Scholarly Communication is **Scientific Communication**, where the main discussions relate to visibility, accessibility, quality, internationalization, international vs. local contributions, and low international recognition of accomplishments (Gevers W., 2009).

The following concept is the **Sociology of science** and includes invisible colleges and epistemic or disciplinary contributions. The disciplinary difference in the communication channels depends on the methods and ways to publish (Crane, 1972; Merton, 1942). The debate related to scientific journals is new paradigms, which change the game rules and the “map” guiding new research. Related studies include Little Science Big Science (Price, Little Science, Big Science- and Beyond, 1963); (Price, Network of Scientific Papers, 1965); Matthew effect (Merton, 1963); Invisible Colleges (Crane, 1972); Scientific Elite (Zukerman, 1996); Bibliometric Measures (Garfield, 1975).

The next concept is **Ethics/Philosophy of Science** related to responsible behaviour and ethics, including plagiarism, salami slicing, harking, and black-market citations. It is based on the premise that indicators generate perversion in the system. They grant power to specific journals, press corporations, or disciplines, transforming them into somewhat of a mafia; in particular, communities or invisible colleges that manipulate citations and articles to publish (black market of citation or the rule of “friends cite friends”).

The following concept is **Research evaluation**. It addresses research evaluation-related scientific policy and involves the variables of scientometric and bibliometric (information science), following generation metrics, and altmetrics measurements. Positive or negative citation without quality distinction generates scientometric indicators to measure authors, institutions, and journals. The question followed was: Do you consider the negative citation compared to other peer review methods to define the prizes, salaries, or other organizations’ incentives? The main criticism was the excessive use of the impact factor as the leading indicator for research evaluation.

The discourses around science, technology, and social studies in the international dynamics are marked by the use of science and technology and innovation strategies implemented by supranational organizations and high-income countries. The use of scientometric indicators is highlighted as playing an important role. In Latin America, the discourse is marked by specific science, technology, society, or social studies of science. With the models’ critical and reflective rhetoric, “The development of cultural patterns and imitative policies has been a typical feature of Latin America” (Albornoz, 2007). The



influence of agencies and national science and technology has generated a dependency theory, contextualized in difficulty formulating appropriate regional policies (Dagnino, 1994). Several Latin American authors have mentioned that research policies should be analysed from a suitable local context.

These domains are the first approach to the literature to understand the research question:

*How do university research governance actors respond to the internationalization-driven tensions and Publindex's policy changes and determine the points that should be emphasized to alleviate them?*

This first section presents an overview of the narratives related to scientific journals' index policies, which brings us to the second section, understanding the logic of the market of scientific journal publishing.

### **3.3. The 'business market' of scientific journal publishing tensions**

This section presents the literature review around the dynamics of the "business market" of scientific journal publishing, where rankings and standards are the primary sources of knowledge commodification that affect university research governance.

#### ***Rankings***

The global prevalence of university rankings in Annex 1 shows the top rankings and the main factors to measure research outputs that focus on scientific production using Scopus indicators. "Rankings have stimulated debate on the quality, relevance, and overall performance of higher education systems and has had a big hit on higher education's internationalization" (De Filippo et al., 2012, p. 20).

In Colombia, universities' pressure to be part of these databases and rankings has affected university policies, publication processes, and quality standards, raising concerns

on quality vs. quantity, affecting national journals' relevance, and limiting their international recognition and visibility goals. These demands have generated resistance and forced research management to find ways to comply with these agendas despite their institutional capacities and challenging the institutions and actors at all levels.

This indicates that the variables used by the rankings might not capture the concepts they claim to measure. The study provides evidence of the ambiguous nature of university rankings quantification of university performance. We conclude that universities should be highly cautious in rankings and rankings data for internal performance assessment and should not rely on rankings as a measure to drive strategy. A ranking is simply a representation of the ranking data. It does not cover all aspects of a university's performance, but it may also be a poor measure of the aspects it is intended to cover. (Selten et al., 2020, p. 1133)

Several studies have shown the harmful effects of rankings on higher education and research. Global university rankings report and legitimize global knowledge production inequalities, reflecting these pre-existing inequalities by not rewarding knowledge generated in the periphery (Rowlands & Wright, 2020, pág. 5). External factors such as international and national ranking measurement models and research evaluation models have transformed autonomy dynamics in research agendas. "The discussion considers the claim that impact assessment threatens academic autonomy by introducing yardsticks other than scientific quality and assessors other than fellow scientists" (Smitha et al., 2011, p. 1370).

Homogenization and standardization through performance indicators and metrics have resulted in the decontextualization of local needs:

Each discipline in Science has its particularities in communicating, writing, and citing research within the field. These make comparative analysis across disciplines a problematic endeavour that can lead to the analysis's inadequacies and biases. These biases have to be correctly identified, and the final desired outcome is to make a meaningful comparative analysis based on bibliometric performance measures across disciplines (Ramírez, 2002, p. 13).

### *International Standards*

International standards such as certifications and rankings through academic quality standards that evaluate and measure research have generated the risk of homogenization and loss of autonomy and independence in higher education organizations. “One can now easily understand why researchers are suggesting the use of this model as a way to overcome new environmental constraints” (Bugandwa Mungu Akonkwa, 2009, p. 321; Henkel, 2005, p. 169).

Among the main discussions is the exclusion of other modes of knowledge production, the lack of recognition of local contexts as explained by Paradeise and Thoeing:

Quality judgments in terms of academic standards of excellence required by external stakeholders such as labour markets and steering hierarchies exert intense pressure on universities. But, do they generate an ‘iron cage’ effect, imposing passive and uniform conformity on global standards? Three sociological concepts –diversity, recognition, and local order– (2013, p. 189).

Research Management units must adapt and comply with these standards generates tensions within the organizations with some regions of knowledge that do not feel identified with these models:

The efforts of the university research units that manage research management influence the dynamics related to strategic investment and budget reorganization; appropriate organizational structures, including performance indicators, compared to national and international standards; adjustments for competitive global performance preferences or niche fields priorities; research and cluster centers capable of obtaining external funding; resource allocation and alignment of research priorities; Higher Education Institutions –HEI- strategic alliances with industry partners; management and approval boards of research strategies; and the broad definition of the research that recognizes the skills of the powers that be. (Hazelkorn, 2005, p 11.)

Understanding the effect of internationalization as the main driver through rankings and standards according to the discussions in the literature allows us to understand the tensions derived concerning scientific production and the actors' behavior, which will explain in the following section.

### 3.4. Scientific journal policy-derived tensions

Following the overview presented using the literature review within the domains established and the dynamics of the “business market” through the internationalization of scientific journal publishing, this section delves into the literature related to the tensions arising from the scientific journal index policy.

Several tensions were identified in conducting the general literature review concerning scientific journals. During the fieldwork at the Publindex-related conferences, these tensions were contrasted with the information gathered at these events and discussed during the focus groups to generate statements to formulate the questions asked during the actor interviews. After this process, the tensions were focused and honed to produce a final arrangement of tensions that encompass the existing issues. This structure is used here to present the results of the literature review. To reiterate, although the tensions are presented as two tensions, they are not independent; they follow a cause-effect mechanism that yields adverse effects on the scientific journal publishing environment in Colombia. For example, tension 1 includes internationalization, the primary driver that affects incentives and evaluation mechanisms.

#### **Tension 1. The assessment factors. Internationalization, Indicator as a starting point for incentive design scientific production, and Evaluation Mechanism**

##### **Tension 1.1. Internationalization**

The following factors have marked internationalization in scientific production:

1. Indexing processes in international systems such as Web of Science, Scopus, specialized databases,
2. Metric citation indicators such as the impact factor,
3. Indicators of collaborative authorship, and
4. Levels of exogamy concerning scientific committees, editorial committees, peer reviewers, and authors.

The internationalization of scientific production through metric indicators has improved the quality standards of scientific production and enabled the comparative analyses of the development of scientific production using evaluation instruments, comparative analysis, and rankings structures (Moed, 2017), (Gläser, 2018). However, some consequences have been related to consolidating disciplinary scientific communities in local, disciplinary, or specific contexts. The system addresses the impact on local epistemic communities of contexts or specialized disciplinary areas.

A balance should be found between international recognition and local capacities developed in terms of contextual issues. For the editor of the journal, *Science*, “Publishing in scientific journals is the most common and powerful means to disseminate new research findings. Unfortunately, most scientists in developing countries remain at the periphery of this critical communication process, exacerbating their accomplishments’ low international recognition and impact” (Gevers, 2009, p 920.). As Noorden (2014) describes, “Many may underestimate South America’s research strength because its researchers often publish in journals that are not indexed in major citation databases” (p 203). Russell (1998) agrees that:

Science from peripheral countries is published through national journals that are under-represented in international databases, and that the publication patterns of scientists from these countries fall into two categories: 1. A few who publish preferably in the mainstream scientific literature; 2. And the vast majority, who publish mainly through national and regional journals. (p. 114).

The impact factor and international index have underestimated the national and regional index models. Regarding the Latin-American context, Vessuri (1995) explains that:

Publications are in a vicious circle: national publications do not have international prestige and circulation because regional scientists publish their best results abroad, but Latin American researchers also publish abroad because national journals do not take their results to the international scientific community. (p. 147).

In the same line, Moravcsik (1989) argues that:

Third World science is under-represented in international databases. Suppose the scientific infrastructure of such countries is to be studied in particular. In that case, the data obtained from them must be supplemented by data specifically from local or regional scientific journals published in the Third World. (p. 313).

Following the tip of the iceberg metaphor, indexing systems only show the tip but not the hidden (underwater) and invisible part of the iceberg. The contents of historical, scientific production are found in the national and regional systems, where the scientific production of the Latin American region has been represented. Therefore, movements like FOLEC<sup>20</sup> in Latin America have begun transforming the mechanisms for evaluating research and constructing updated research information systems. The knowledge produced has the metadata that allows it to be analysed and represented.

### Tension 1.2. Indicator as a starting point for incentive design scientific production

Indicators in research, as mentioned above, have had a robust scientometric emphasis, specifically on indicators measuring the production of scientific articles and citations. According to Cabinet (1989), it is “A proxy measure when output or performance is not directly measurable. For example, the number of citations received is an indicator of research but does not represent the whole picture” (p. 67). Academia’s incentives and reward structures have undergone a dramatic change in the last half-century. However, the main driver continues to be citation-based rankings to determine the standings of institutions, journals, and journal publication-related actors, which for the latter mentioned, even includes career development and salaries. This citation-based concept creates issues within the context of developing countries.

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<sup>20</sup> Latin American Forum on scientific evaluation “The Latin American Forum on Scientific Evaluation (FOLEC) is a regional space for debate and exchange on the meanings, policies and practices of scientific evaluation processes in the region, from a perspective that strengthens the open, common and public domain nature of knowledge and its link with democratizing and sustainable approaches and models of science, committed to the problems of our societies. From a broad and plural perspective, it seeks to socialize experiences and find points of agreement in order to build and strengthen regional evaluation instruments and move towards guidelines that commit the scientific systems of the different countries”, <https://www.clacso.org/folec/>

One of the considerations of using citation criteria for research excellence is related to the issue of quality. Several authors have already referred to the dilemmas of the citation impact factor, which does not have clear criteria for defining quality; a citation can be cited for positive or negative reasons. Regarding the citation concept, the ex-rector of the Universidad Nacional de Colombia (Mantilla, 2018) states:

The quantitative classification criteria for establishing this list type sometimes give us unexpected results and big surprises. As Umberto Eco noted in 2003, if we were to be guided exclusively by the weighting and value given today, especially to citations of authors or their works, we risk not qualifying professors' academic resumes in universities distinguishing between positive and negative citations. But if we try to keep only the positive citations, we also run risks.

In the case of socio-scientific journal index and measurements, Seglen (1997) has stated that "The journal impact factor would still be far from being a quality indicator: citation impact is primarily a measure of scientific utility rather than scientific quality. Moreover, arts' selection of references is subject to strong biases unrelated to quality" (p. 10). For Waltman and Traag (2017), "Our analysis shows that these arguments do not support the conclusion that the impact factor should not be used for assessing individual articles." (p.1)

When a specific indicator becomes the incentive for developing an ecosystem, it runs a high risk of being manipulated or generating perversions if it is not transformed over time. According to the *Cambridge Dictionary*, incentives are "something that encourages a person to do something." Thus, Franks (2002) considers incentives modelling behaviour. In this regard, the author states:

Somewhat schematically, we can distinguish three levels at which financial incentives are being inserted into the allocative process for university resources: at the level of inter-university competition, inter-faculty (or interdepartmental) competition, and competition between individual academics. There is good reason to think that their efficacy is likely to vary between these levels. Different types of responses can be expected according to the directness of the connection between individual and reward. (p. 53)

In terms of research organization evaluation, Cox and Barker state that:

The incentives for Evaluation naturally vary according to the actor and their position concerning Evaluation. Evaluation of research organizations produces some perverse incentives as researchers and organizations always seek to achieve the highest rating possible. These include affecting the choice of publication practices to suit what is considered the best strategy for a good outcome. In the evaluation system, which counts publications, there is evidence of spreading material across several articles to increase publication rates” (2011, p. 10).

Regarding scientific publications, Binswanger expresses that:

Several perverse incentives are associated with the competition for publication. This includes strategic citing and praising, an endless variation of existing models and theories, and emphasizing formal and mathematical skills while emphasizing a paper’s content. Furthermore, to maximize the number of publications, scientists also try to squeeze out as many publications as possible from minor ideas (salami tactics), increase the number of co-authors, test to become ever more specialized in already highly specialized scientific disciplines and, in the most extreme case, just fake experiments and results. Engaging in all these activities is a waste of time as it does not foster scientific advancement. Instead, it crowds out professors and other scientists’ intrinsic motivation, essential for creativity. (2015, p. 19)

Several authors have discussed perverse incentives, emphasizing quality-in-research versus quantity-in-research and the effects of perverse incentives (Edwards & Siddhartha, 2017, pp. 51, 53). Other studies have addressed understanding the relationship between rewards and intrinsic motivation (Skinner, 1938; Deci et al., 1999). Moreover, motivation theorists have argued that extrinsic rewards are likely to undermine intrinsic motivation (Heinrich & Marschke, 2010, p. 86).

Glaser and Grit (2007) have mentioned the relationship between incentives and salary. In this regard, the authors stated: “While the yearly performance appraisals are conducted rather informally within the schools and are inconsequential even where salary increments are concerned, assessing individual research performance informs decisions about promotions (from lecturer to senior lecturer, associate professor, and full professor).”



(p. 140). Competition has also increased for tenure-track positions. “It is possible to pay workers and still have them intrinsically motivated. Hence, the writer favours the prescription to concentrate on structuring situations and jobs to arouse intrinsic motivation rather than structure piece-rate and other contingency payment schemes. Thus, workers would be intrinsically motivated and seek to satisfy their higher-order needs through effective performance” (L. Deci, 1972, pág. 227).

The following table shows the literature regarding publications addressing salary points and bonuses in scientific production in countries outside of Colombia.

**Table 2. Scientific production Bonuses Incentives National Cases**

Bonuses Incentive Case	Description
United States	“Tenure in U.S. universities is highly prized because it effectively means that an academic researcher has a “job for life” with arguably minimal ongoing accountability. The economic security and symbolism of tenure, combined with steep competition for academic appointments and research funding and increased use of metrics for evaluation purposes, have led critics to argue that academic incentives have become increasingly perverse and may even promote scientific misconduct.” (Grant, 2021)
Hungary	Hungary’s primary granting agency (National Research, Development and Innovation Office) just launched a new grant that awards a considerable sum to highly cited individuals and automatically awarded 20 million Hungarian Forints (ca. 64,000 Euro or 76,000 USD) to those who can get their paper into the top 5% in their discipline within two years. However, “When science becomes a business, what counts is not whether the product is of high quality, but whether it sells.” (Kun, 2018, pág. 6)
Norway	The indicator was developed by the Norwegian Association of Higher Education Institutions (Universitets- og høyskolerådet, UHR) in 2003–4. It is described in detail in the publication <i>A Bibliometric Model for Performance-based Budgeting of Research Institutions</i> (UHR 2004). (Aagaard et al., 2015, p. 107). The indicator situated itself between the cost-intensive peer-review-based models, the citation-based models with coverage problems, and the easily manipulated, undifferentiated publication-based models. In particular, the Norwegian Indicator stood out in this context with its universality, full coverage across all disciplines, differentiated allocation of points, and a high degree of transparency and relatively low costs. All system designs represent different trade-offs (Aagaard et al., 2015, p. 114).
Australia	“Australia adopted an evaluation framework that rewarded publications in (then) ISI-indexed journals. They achieved the desired goal. However, while Australian research commanded a greater share of indexed words, the average impact of this work declined. Pressures on scientists to produce may yield greater production, but may lead to undesirable strategies— such as “salami slicing”—and lower quality work.” (Sugimoto & Lariviere, 2018, pág. 127)
China	“China, for example, provides monetary incentives to authors who publish in journals with a certain Impact Factor. This has been shown to dramatically increase the number of submissions to journals such as Science but not lead to a corresponding increase in acceptances. As a result, the scientific community is burdened with reviewing work submitted to a journal that may not have been appropriate in topic or scope but was prompted by a financial rather than scientific goal. Moreover, the demands to achieve these goals have been linked to fraud and other abuses of the scientific system.” (Sugimoto & Lariviere, 2018, pág. 127)  In China, bonuses are left up to the individual institution. For example, China’s Agricultural University in Beijing will pay up to \$50,000 for high-impact papers, says its president Zhang-Liang Chen. “This is not a big deal for great papers,” he says. The Chinese Academy of Sciences’ Institute of Biophysics in Beijing has a scale tuned to impact factors. Authors published in journals with an impact factor between 3 and 5 receive 2,000 yuan (\$250) per point, while over 10 earn 7,000 yuan (\$875) per point. A paper in Nature, Science or Cell earns 250,000 yuan (\$31,000). The institute has had several articles published over the past few years (Fuyuno & Cyranoski, 2006, pág. 792).

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Korea	The Korean Initiative, funded by the Ministry of Science and Technology, will award 3 million won (US\$3,000) to the first and the corresponding author on articles in key journals. “The plan is part of efforts to raise the morale of scientists who boost development in the country’s science and technology sector,” says Young Nam Lim, deputy director at the ministry’s department of basic science policy. A ten-member committee composed of ministry officials and researchers will choose the relevant journals. They are likely to include Nature, Science, and Cell, among others, Lim says (Fuyuno & Cyranoski, 2006, pág. 792).
Pakistan	In Pakistan, under a system introduced by the science ministry in 2002, researchers can receive \$1,000 to \$20,000, based mainly on the cumulative one-year impact factor of their publications. Half is given as a research grant and the rest for personal use (Fuyuno & Cyranoski, 2006, pág. 792).

Source: Created by the author based on Aagaard et al. (2005, p. 107), Fuyuno and Cyranoski (2006, p. 792), Grant (2021), Kun (2018, p. 6), Sugimoto and Larivière (2018, p. 127).

As seen in the literature and table, using metric indicators as extrinsic incentives in terms of bonus, salary, or tenure track career development, the scientific production systems have shaped the researchers’ behaviour in the last decade. Unfortunately, the consequences have been perverse in terms of inequalities to recognize epistemic communities, autonomy in research agenda, and ethical misconduct

In this regard, the economic incentive theory suggests that indicators related to extrinsic incentives should be reviewed and modified over time, not focusing on a few indicators but creating a battery of indicators to avoid moral hazard. In turn, the organizational incentive theory mentions the importance of balancing extrinsic incentives

with intrinsic incentives to avoid generating perversions or risks in the actors who are motivated to specific patterns or results.

### Tension 1.3. Evaluation mechanisms

Research evaluation mechanisms can use qualitative and quantitative methodologies to define the best scenarios for research evaluation. They are the central axis for defining mechanisms for developing research that can generate a balance between the different tensions that can be generated in scientific ecosystems. According to Cabinet (1989), “Evaluation is the process of checking after a program or project, to what extent and how the objective was met. One purpose of an evaluation is to check that the original objective is still valid. Another is to consider the use made of output” (p. 66).

The tensions behind research evaluation mechanisms have also been discussed. Garret-Jones and Aylward (2000) addressed the tensions between the criteria of excellence and socioeconomic benefits in valuing research outcomes. Regarding externalities, such as corporatizations and new actors, Whitley and Glasser (2009) suggest that they generate market failure rationale; they explain, “A perspective on the mutual enforcement of research evaluation systems and the rise of the university as a more autonomous and managerial actor” (p. 467). Finally, the inequalities in scientific journal production outputs have been discussed in studies like Jimenez-Contreras and Moya (2003), who state that “the evaluation procedure appears to have been most appropriate for research in fields belonging to the exact and experimental sciences” (p. 138).

The evaluation mechanisms of research and scientific production define the actors’ patterns and behaviour within a system. The consequences of the tensions can be given by the lack of actors’ inclusion in the evaluation mechanisms or the asymmetries informing the models.

Professional Evaluation has adopted a key role in analysing and legitimating policy measures and scientific policy governance. The evaluation must assess measures transparently and objectively, distinguishing ‘good’ and ‘bad’ measures. Therefore, professional evaluation producing quantitative evidence is high in demand, e.g., Performance indicators and randomized control group design. (Kuhlmann, 2016, p. 33)

Policymakers need to be aware that:

Evaluation frameworks are not neutral concerning the objectives of an initiative. How a project evaluates will affect how it is conducted and, at least, part of the performers' goals. Focusing on specific outputs can implicitly suggest an intervention rationale that is not concerned about the organization of research and how specific "translational gaps" are addressed. (Mollas-Gallart et al., 2014, p. 241).

The current knowledge has gaps regarding the geographical and scientific discipline and stakeholder coverage and representation. According to Adam et al. (2018), "the guidelines can be further strengthened through evaluation and continuous improvement by the global research impact assessment community" (p. 1). Because there are growing demands and aspirations to measure research impact (beyond academic publications) to understand how science works, and optimize its societal and economic impact, a multidisciplinary practice called research impact assessment (RIA) is rapidly developing.

Table 3 shows cases found in the literature review of responses to research evaluation mechanisms to develop research impact assessment (RIA)

**Table 3. Evaluation Mechanism responses**

Case	Description
European Union's Horizon 2020 research and innovation program	Excellent science, industrial leadership, and societal challenges are three mutually reinforcing priorities: The Responsible Research and Innovation approach. The national assessment will "examine how universities are translating their research into economic, social, and other benefits and encourage greater collaboration between universities, industries, and other end-users of the research." (Grant, 2021). <a href="https://ec.europa.eu/programmes/horizon2020/en/home">https://ec.europa.eu/programmes/horizon2020/en/home</a>
Canada	The Prime Minister's mandate letter to the Minister of Innovation, Science, and Economic Development stresses the importance of focusing on results that benefit Canadians. The Policy on Results for all federal government departments set out accountability for performance information and Evaluation (Grant, 2021).
Australia	The National Innovation and Science Agenda commits to "introduce, for the first time, clear and transparent measures of non-academic impact and industry engagement when assessing university research performance (Grant, 2021).
United Kingdom	Research Excellence Framework (REF) of the Higher Education Funding Council for England, the impact was defined as "an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia." (Grant, 2021). <a href="https://www.ref.ac.uk/">https://www.ref.ac.uk/</a>

The Netherlands	In the Dutch Recognition & Rewards program, cooperate with universities, university medical centers, reputable research institutes, and research funders. The program has been framed: Room for everyone's talent. Current societal challenges demand more cooperation and a multidisciplinary approach by scientists. Putting into practice the shared ambitions in Dutch academia requires the modernization of Recognition and Rewards. The modernization should be designed to improve the critical areas: education, research, impact, leadership, and (for university medical centers) patient care (Grant, 2021). <a href="https://recognitionrewards.nl/">https://recognitionrewards.nl/</a>
DORA: The San Francisco Declaration on Research Assessment	Currently, DORA is building tools to help institutions experiment and improve their research assessment practices. It includes five design principles to facilitate the development of 12 new policies and a set of strategies to help institutions address the infrastructural implications of common biases in research assessment (Stephen Curry, 2020). <a href="https://sfdora.org/">https://sfdora.org/</a> <a href="https://sfdora.org/resource-library/">https://sfdora.org/resource-library/</a>
The Leiden Manifesto for research metrics	The Leiden Manifesto was co-authored by a group of scientometric and science policy analysts and published in April 2015. It sets out ten principles for the use of 14 quantitative indicators in research evaluation. It was born from the scientometric community's growing realization of the need to offer more precise guidance to end-users of bibliometrics in research evaluation. The first draft of the principles was presented at a conference in 2014 and developed over multiple iterations into the final version. <a href="http://www.leidenmanifesto.org">http://www.leidenmanifesto.org</a>
The Metric Tide	The Independent Review of the Role of Metrics in Research Assessment and Management was set up in 2014 by the Higher Education Funding Council for England (HEFCE). Chaired by James Wilsdon, with an interdisciplinary expert group drawn from across the research system, the group published its findings as The Metric Tide in July 2015. The primary impetus for the review was a desire by policymakers to explore whether metrics could play a more significant role in the next cycle of the U.K.'s Research Excellence Framework (REF). <a href="https://re.ukri.org/sector-guidance/publications/metric-tide">https://re.ukri.org/sector-guidance/publications/metric-tide</a>
Science in Transition	Science in Transition is a movement established in 2013 by researchers in the Netherlands and Jerome Ravetz. It aims to tackle systemic problems in research and university culture, which is criticized for having become "a self-referential system where quality is measured mostly in bibliometric parameters and where societal relevance is undervalued." The movement addresses systemic institutional change by involving universities' academic leadership, especially rectors, deans, Royal Academies, and prominent scholars, alongside public and private funders. (Dijstelbloem et al., 2013) <a href="https://scienceintransition.nl/en">https://scienceintransition.nl/en</a>
Hong Kong Principles for Assessing Researchers	The Hong Kong Principles were formulated and endorsed at the 6th World Conference on Research Integrity in June 2019 and published in final form in PLOS Biology in July 2020. They are 21 principles designed to help research institutions adopt them to minimize perverse incentives and recognize and reward trustworthy research. The principles also support the inclusion of behaviour that strengthens research integrity in career appraisal and advancement frameworks. Five principles were formulated: assess responsible research practices; total value reporting; reward the practice of open Science; acknowledge a broad range of research activities; recognize other essential tasks like peer review and mentoring. Institutions and individuals are invited to endorse the Hong Kong Principles on its website <a href="https://www.wcrif.org/guidance/hong-kong-principle">https://www.wcrif.org/guidance/hong-kong-principle</a>
HuMetricsHSS (Humane Metrics Initiative)	Established in 2016, HuMetricsHSS is an initiative to create and support values-enacted frameworks for understanding and evaluating all aspects of the scholarly life well-lived and promoting the nurturing of these values in scholarly practice. With support from the Andrew W. Mellon Foundation, HuMetricsHSS has developed humane indicators of excellence in academia, focused mainly on the humanities and social sciences (HSS). <a href="https://humetricshss.org/">https://humetricshss.org/</a>
INORMS Research Evaluation Working Group	The International Network of Research Management Societies (INORMS) brings together research management societies and associations worldwide. Its Research Evaluation Working Group was established in 2018 to consider how best to ensure that research evaluation is meaningful and responsible. Outputs of its work include The SCOPE model, which is intended to support senior managers in undertaking responsible research assessments. The model has five stages: (1) Start with what you value; (2) Context considerations; (3) Options for measuring; (4) Probe deeply; and (5) Evaluate your Evaluation. In addition, the Rating the Rankers project has developed four criteria for fair and responsible university rankings: fairness, good governance; transparency; and measuring what matters. It then assessed six of the leading global rankings against these criteria, finding that few of them perform well. <a href="https://inorms.net/activities/research-evaluation-working-group/">https://inorms.net/activities/research-evaluation-working-group/</a>

Open Science Policy Platform and Next Generation Metrics	In 2016, the European Commission set up an Open Science Policy Platform to develop guidelines on all aspects of available research as part of its planning for the next E.U. framework program, Horizon Europe. One of the expert groups, created under the OSPP's auspices, was tasked with addressing the responsible use of metrics. This group included Paul Wouters (co-author of The Leiden Manifesto and The Metric Tide) and James Wilsdon (chair of The Metric Tide). Its report, Next Generation Metrics, was published in March 2017 and was well received by E.U. policymakers. Its recommendations and related groups on indicators and incentives were included in the OSPP's final report, published in April 2020.
Science Granting Councils Initiative	The SGCI is a multi-funder initiative supported by the Swedish International Development Cooperation Agency (SIDA), the U.K.'s Foreign, Commonwealth, and Development Office (FCDO), Canada's International Development Research Centre (IDRC), South Africa's National Research Foundation (NRF), and the German Research Council (DFG). The SGCI is organized into two phases (SGCI-1 from 2015 to 2020; and SGCI-2 from 2018 to 2025). Specifically, the initiative strengthens the ability to participate in councils to (i) manage research; (ii) design and monitor research programs, and to formulate and implement policies based on the use of robust science, technology, and innovation indicators; (iii) support knowledge transfer to the private sector, and; (iv) establish partnerships among Councils and with other science system actors. <a href="https://sgciafrica.org/en-za">https://sgciafrica.org/en-za</a>
Global Young Academy Working Group on Scientific Excellence	The Global Young Academy provides earlier career scientists with a voice and platform for debating the future of science and its relationship to policy and society. Its working group on Scientific Excellence undertakes evidence-informed analysis and advocacy on issues of research measurement and evaluation. In 2018, it published a report on publishing models, assessment, and Open Science, including 15 recommendations for 28 improving research evaluation processes.
Helsinki Initiative on Multilingualism in Scholarly Communication	Multilingualism is an important but often neglected dimension of diversity in research that ensures that research remains locally relevant and accessible. Launched in 2019, the Helsinki Initiative and its linked "In all Languages" campaign were developed by the Federation of Finnish Learned Societies (TSV), the Committee for Public Information (TJNK), the Finnish Association for Scholarly Publishing, Universities Norway (UHR), and the European Network for Research Evaluation in the Social Sciences and the Humanities. <a href="https://www.helsinki-initiative.org/en">https://www.helsinki-initiative.org/en</a>
ENRESSH  FOLEC: Latin American Forum on Research Assessment	Its three core recommendations are: Support the dissemination of research results for the full benefit of society. Ensure researchers are recognized for disseminating research results beyond academia and interacting with heritage, culture, and society. The Latin American Forum for Research Assessment (FOLEC) is a regional space for debate and exchange on the region's meanings, policies, and research evaluation practices to strengthen the open, shared, and public domain of knowledge. It seeks to share experiences and find agreements to build and promote regional evaluation instruments and guidelines from a plural viewpoint. In partnership with the Latin American Council of Social Sciences (CLACSO), FOLEC has published a series of reports and statements to develop regionally-specific guidelines for research assessment and mobilize support for these among funders research institutions and other stakeholders in Latin American research. <a href="https://www.clacso.org/en/folec">https://www.clacso.org/en/folec</a>
Science Europe Position Statement on Research Assessment Processes	Following a comprehensive study of current funder policies and practices and a consultation process with 30 members, in July 2020, Science Europe published a position statement and set of recommendations to guide evaluation and assessment processes. These recommendations are intended to complement DORA and the Leiden Manifesto. They establish that: <ul style="list-style-type: none"> <li>● Research assessment processes must be clear and transparent.</li> <li>● Research organizations should monitor and regularly evaluate their assessment processes' robustness and share best practices to foster mutual learning.</li> <li>● Research organizations should publicly demonstrate and continually evaluate how they address bias, discrimination, and unfair treatment in assessment processes.</li> <li>● Research organizations should streamline assessment processes to reduce the burden on reviewers and applicants.</li> <li>● Research assessments should focus on the substance and content of applications.</li> <li>● Research organizations should consider implementing novel assessment techniques.</li> </ul> <a href="https://www.scienceeurope.org/">https://www.scienceeurope.org/</a>
FOLEC: Latin American Forum on Research Assessment	The Latin American Forum for Research Assessment (FOLEC) is a regional space for debate and exchange on the region's meanings, policies, and research evaluation practices to strengthen the open, shared, and public domain of knowledge. It seeks to share experiences and find agreements to build and promote regional evaluation instruments and guidelines from a plural viewpoint. In partnership with the Latin American Council of Social Sciences (CLACSO), FOLEC has published a series of reports and statements to develop regionally-specific guidelines for research assessment and mobilize support for these among funders research institutions and other stakeholders in Latin American research. <a href="https://www.clacso.org/en/folec">https://www.clacso.org/en/folec</a>

<p>Science Europe Position Statement on Research Assessment Processes</p>	<p>Following a comprehensive study of current funder policies and practices and a consultation process with 30 members, in July 2020, Science Europe published a position statement and set of recommendations to guide evaluation and assessment processes. These recommendations are intended to complement DORA and the Leiden Manifesto. They establish that:</p> <ul style="list-style-type: none"> <li>• Research assessment processes must be clear and transparent.</li> <li>• Research organizations should monitor and regularly evaluate their assessment processes' robustness and share best practices to foster mutual learning.</li> <li>• Research organizations should publicly demonstrate and continually evaluate how they address bias, discrimination, and unfair treatment in assessment processes.</li> <li>• Research organizations should streamline assessment processes to reduce the burden on reviewers and applicants.</li> <li>• Research assessments should focus on the substance and content of applications.</li> <li>• Research organizations should consider implementing novel assessment techniques.</li> </ul> <p><a href="https://www.scienceeurope.org/">https://www.scienceeurope.org/</a></p>
<p>Association (EUA) Roadmap on Research Assessment in the Transition to Open Science</p>	<p>The EUA represents more than 800 universities and national rectors' conferences in 48 European countries. In 2018, it published a Roadmap on Research Assessment in the Transition to Open Science, which aimed to raise awareness and support the EUA membership with responsible research assessment that considers Open Science practices. This roadmap was followed in 2019 by a briefing paper that outlines the key concepts, issues, and actors involved in 31 research assessments, focusing on practical examples of new and innovative practices being developed and implemented. These publications are part of EUA's ongoing efforts to support member institutions in developing Responsible Research Assessment<sup>21</sup> approaches encompassing quality, potential, and impact.</p> <p><a href="https://eua.eu/resources/publications/316:eua-roadmap-on-research-assessment-in-the-transition-to-open-science.html">https://eua.eu/resources/publications/316:eua-roadmap-on-research-assessment-in-the-transition-to-open-science.html</a></p>
<p>Welcome Trust's campaign to Reimagine research</p>	<p>In February 2019, as part of its broader commitment to diversity and inclusion and building a healthier research culture, the Wellcome Trust launched a high-profile campaign to reimagine research. Sir Jeremy Farrar, Wellcome's Director, explained: "The relentless drive for research excellence has created a culture in modern Science that cares exclusively about what is achieved and not about how it is achieved. As I speak to people at every stage of a scientific career, although I hear stories of wonderful support and mentorship, I also hear more and more about (...) instances of destructive hyper-competition, toxic power dynamics, and poor leadership behaviour – leading to a corresponding deterioration in researchers' wellbeing (...) I believe that we now also have an important role to play in changing and improving the prevailing research culture."</p> <p><a href="https://wellcome.org/what-we-do/our-work/research-culture">https://wellcome.org/what-we-do/our-work/research-culture</a></p>
<p>Research Quality Plus (RQ+) to assess their research projects in a more holistic manner</p>	<p>Because citations and other traditional indicators of success fail to capture the impacts of applied and translational research on local communities, Canada's International Development Research Centre (IDRC) developed the RQ+ framework. It involves three main components to guide assessment. They are: identify contextual factors, articulate dimensions of quality, and use rubrics and evidence. The review process itself comprises three steps: 1) characterize the critical contextual influences on the project, 2) identify the qualities of the research, and 3) synthesize the ratings using customizable rubrics. The use of clear rubrics at different stages in the evaluation process instils standards and structure, enabling fairer comparisons across a portfolio of very different projects. Mechanistically, the rubrics also inject positive friction into the process, forcing evaluators to slow down and think critically before making judgments. The first rubric is designed to characterize the key influences most likely to affect the quality of the research, such as maturity of the field, research capacity, strengthening, and risk in the data, research, and political environments. The second one is used to evaluate the quality of the research. In addition to rating research integrity, legitimacy, and importance, evaluators also consider how well it is positioned for use by the community. RQ+ costs more than traditional approaches to assessment that rely on evaluators' opinions because it requires evaluators to collect and analyse data during the review process. For example, evaluators conduct qualitative interviews with actual or prospective research users to gauge how well it is positioned for use. However, IDRC believes the investment in RQ+ has paid off by informing their funding strategy.</p> <p><a href="https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/56730/IDL-56730.pdf?sequence=2&amp;isAllowed=y">https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/56730/IDL-56730.pdf?sequence=2&amp;isAllowed=y</a></p>

Source: (Adam, et. al, 2018), (Dijstelbloem et al., 2013), (Stephen Curry, 2020), (Grant, 2021).

<sup>21</sup> "How to create a healthy working culture for researchers, how to promote research integrity, how to move from closed to open knowledge and how to embed the principles of equality, diversity and inclusion across the research community. Shifting the reliance on metrics towards more qualitative or mixed methods modes of evaluation. It encourages funders, research institutions, publishers and others to focus attention on the fundamental aspects - methodologies, systems and cultures - of research evaluation. Essentially, it is a relational concept, in the sense that it is an important feature of any responsible evaluation process" (Curry et al., 2020).

According to the literature and global responses, developing new research evaluation mechanisms to mitigate the system's risks or deviations from a purely metric approach to productivity indicators has enabled studies involving the practical implementation of tools, responding to research evaluation mechanisms in national and institutional policies and strengthening the study of the Science of Science (Xie et al., 2021). Thus, the movements of Responsible Research Innovation, responsible metrics, and DORA have allowed the different actors in the scientific ecosystems to propose more holistic research evaluation mechanisms contextualized to the realities and disciplines.

## **Tension 2. Index-Journal effect. Epistemic Communities, autonomy in research agenda, and ethical misconduct.**

### **Tension 2.1. Epistemic Communities**

Epistemic communities have been consolidating asynchronously in different contexts. In recent decades, technologies and globalization have allowed these communities to have new interrelationships and consolidate new knowledge construction forms. However, according to geographical, cultural, language contexts, and context needs, these developments have had other developments, leading to the response and consolidation of different research questions or needs.

Different concepts have been developed around the term epistemic communities, which involves researchers, scientists, or academics around the consolidation of epistemic communities around a particular area of knowledge. Furthermore, the disciplinary communities' maturation processes have been transformed over time by disciplinary specializations and developments within the field in some geographical regions, influenced by the indicators as a starting point for incentives design scientific production or mechanisms they are evaluated.

The term "epistemic communities" has been defined or used in various ways, most frequently to refer to scientific communities. According to Haas (1992), epistemic communities are "a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that



domain or issue-area” (p. 3). Some authors insist that epistemic communities primarily involve natural scientists and adhere to a stricter definition than other authors, like Holzner and Marx. They use the term epistemic community,” referring to a shared faith in the scientific method as a way of generating truth. By their definition, what bonds members of an epistemic community is their shared belief or faith in the variety and applicability of particular forms of knowledge or specific truths. However, this definition ignores the fact that this faith also bonds people with diverse interpretations of ambiguous data. According to Haas, in the stricter sense, the notion of “epistemic community” somewhat resembles Fleck’s notion of a “thought collective,” a sociological group with a standard thinking style. It also somewhat resembles Kuhn’s broader sociological definition of a paradigm, which is “an entire constellation of beliefs, values, techniques, and so on, shared by members of a given community” and which governs “not a subject matter but a group of practitioners” (Haas, 1992, p. 3).

Regarding scientific communities, Kornfeld & Hewitt (1981) state that

It is a diverse network of interacting scientists that includes many sub-communities working in particular scientific fields and institutions; interdisciplinary and cross-institutional activities are also significant. Objectivity is expected to be achieved by the scientific method. Peer review assists in this objectivity through discussion and debate within journals and conferences by maintaining the quality of research methodology and interpretation of results. (p. 2)

Another concept used is the invisible college. The concept of the invisible college was developed in the Sociology of Science by Merton (1942) and Crane (1972), building on Derek J. de Solla Price's (1965) work on citation networks. Crane (1972) and Merton (1942) inspired the discussion on the invisible colleague and the confirmation of disciplinary contribution. “The disciplinary difference in the communication channel and legitimation changes depends on the methods and scholarly communication channel to publish. The evaluation mechanism has contributed to the epistemic communities’ behaviour” (Crane, 1972, p. 11). The author continues in this regard:

Within this context of social change, we come upon the contemporary relevance of a long-standing problem in the sociology of knowledge: the problem of patterned differentials among social groups and strata in access to certain types of knowledge. In its strong form, the claim is put forward as a matter of epistemological principle. Notably, groups in each moment of history have monopolistic access to particular kinds of knowledge. In the weaker, more empirical form, the claim holds that some groups have privileged access, with other groups also able to acquire that knowledge for themselves but at greater risk and cost. (p. 11)

On the term cognitive injustice, Boaventura de Sousa Santos (2010) has formulated an even more radical approach. He uses the term cognitive injustice to describe the exclusion of knowledge from the Global South. The author sets out two premises of an epistemology of the South:

First, the understanding that the world is much broader than the Western understanding of the world. Second, the diversity of the world is infinite. This immensity of life alternatives, friendliness, and interaction with the world is essentially waste because the theories and concepts developed in the global North and employed in the entire academic world do not identify such alternatives. When they do, they do not value them as being valid contributions towards constructing a better society. (p. 51)

Medvecky explains that:

We can think of epistemic justice regarding standard distributive justice issues: who gets access to knowledge? And we can think of epistemic justice in terms of justice for the knower: whose knowledge is considered valuable or worthwhile or reliable? These highlight critical moral issues for science communication. (2018, p. 1395)

In the same line, Bai (2020) expands: "According to the current Science structure, scientists are determined by highly competitive funding, publishing, and peer review system. Still, the interests of less privileged groups of people, such as the poor and minorities, tend to neglect research agendas" (p. 219).

According to the literature, epistemic communities have different levels of development or maturity. Indicators mediate their levels as a starting point for incentives design for scientific production and the respective evaluation mechanisms of scientific policies. However, models of research internationalization centered on metric indicators have generated epistemological injustices, failing to recognize the development of community capacities in the specific and disciplinary contexts corresponding to a country or region's development or its problems, discussions that may involve different interests or needs.

### Tension 2.2. Autonomy in the research agenda

Research autonomy is marked by several factors mainly related to management processes and accountability, influenced by national or international policies on research measurement indicators or by the corporations that fund research projects. For researchers, maintaining research autonomy is mediated by the granting of funding for their research or by the purposes of institutional research agendas.

Sanz-Menéndez (2018) frames autonomy as follows: “the concept of the ‘autonomy’ of the researcher as discretion over the goals and methods and control over the work process. Refers to ‘strategic autonomy,’ the freedom to set one’s research agenda and directions versus ‘operational autonomy” (p. 138

Research autonomy is closely related to a research institution’s autonomy; usually, universities face external and internal pressures to mediate their autonomy. In terms of university autonomy, Whitley (2012) states:

An essential aspect of such strategic autonomy is their capacity to control the conditions under which academic staff is recruited, assessed, and rewarded. Given their critical role in conducting research and teaching, universities’ discretion over their terms and conditions of employment constitutes a critical distinguishing aspect of their organizational actor hood. (p. 497)

The persistent tension between managers and researchers over evaluation reporting processes at the individual and institutional levels requires constant mediation to find a balance in the processes. According to Sutz (2003):

Academic research agendas are under strain everywhere. Some commentators perceive it as the natural outcome of the ever-increasing importance of knowledge production for economic growth: the loss of academic freedom and autonomy in selecting the research agenda represents a desirable move away from the ivory tower and toward a situation in which “society.” (p. 56)

The urgency to balance research management and researcher autonomy is one of the critical points in the literature. These evaluation mechanisms allow for mediation so that researchers maintain a degree of freedom amid reporting and evaluation pressures.

### Tension 2.3. Ethical misconduct

One of the consequences of incentives focused on scientific production is scientific misconduct. The most common inappropriate behaviour is overlapping publication or recycling research or texts, retraction, republications, followed by plagiarism and authorship, predatory pseudo journals, issues involving people who have not necessarily worked on the research to the extent of consideration as authors.

In the literature, one of the concepts generating organizational pressure is the dynamics of “publish or perish” (see Table 4) on the consideration for promotion in the academic career, institutional credibility, or the accreditation recognition based on ranking categorizations. In this regard, the literature also indicates a significant concern for the integrity of the impact factor as a quality criterion. As one of the leading indicators to measure national or international excellence in these categorizations, the impact factor has implications on ethics in scientific integrity that could lead to scientific misconduct such as plagiarism or conflicts of interest.

Table 4. The pressures of Publish or Perish

CONCEPTS: ORGANIZATIONAL PRESSURE + PUBLISH OR PERISH
Institutional Credibility. National and international Excellence, Impact Factor vs. quality criteria. Ethical issues, scientific integrity, scientific misconduct, plagiarism, conflict of interest. Promotion and tecnure considerations.

The concept of “publish or perish” has gained momentum in the academic and scientific world. According to Rawat and Meena (2014):

The frequent publication is one of the few powerful methods at scholars’ disposal to demonstrate academic talent to peers. Successful publication of research brings attention to scholars and their institutions. This may bring in more funding for the institute and ensure an individual’s progress through their field. Academic institutions and universities frequently use the number of publications to an individual’s credit to measure competency. (p. 87)

The pressure to publish brings about different consequences. A prominent issue in the literature is the premise that “publish or perish” pressures by the scientific journal indexing system drive low-quality science. “The incentives granted to researchers by universities or funding agencies seem to directly impact perpetuating unethical practices or bad Science, such as incentives based on the number of publications rather than their quality” (“Incentive malus,” 2016). According to Fong and Wilhite (2017):

This combination, the pressure to increase publications, and the increased difficulty of publishing, can motivate academics to violate research norms. Some scholars add authors to their research articles or grant proposals, even when contributing nothing to the research effort. Some journal editors coerce authors to add citations that are not pertinent to their work, and some authors pad their reference lists with superfluous citations. (p. 1)

The review also evidenced literature addressing bad practices, so-called predatory practices in the academic and scientific community, and attempts to reduce them. O’Donnell (2017), for example, addresses the term “predatory publishing,” defining it “as an opportunistic publishing venue that exploits the academic need to publish but offers little

reward for those using their services.” The scientific community has been long working on the definition of a predatory journal. These efforts have led scholars and publishers from ten countries to agree on a definition of predatory publishing that can protect scholarship. According to Grudniewicz et al. (2019):

Predatory journals and publishers are entities that prioritize self-interest at the expense of scholarship and are characterized by false or misleading information, deviation from best editorial and publication practices, a lack of transparency, and the use of aggressive and indiscriminate solicitation practices. (p. 212)

A negative consequence of the rapid growth of scholarly open-access publishing funded by article processing charges is publishers’ and journals’ emergence with highly questionable marketing and peer review practices. These so-called predatory publishers are causing unfounded negative publicity for open access publishing in general.

Predatory practices are defined as actors (researchers, publishers, journals, universities, institutions, and corporations) in pursuit of indicators for results rather than quality processes that predate the research system. An example is fraudulent practices or research misconduct to increase the number of articles indexed in indexing systems to increase rankings or salaries. The fundamental question here is, as long as ranking by results rather than process continues to be accepted, who is the natural predator in the system? Regarding the concept of research misconduct, Koehlmoos and Smith (2013) state that “Everybody agrees that research misconduct includes fabrication (making up results), falsification (manipulating processes and results), and Plagiarism (stealing other’s work). The U.S. government has a long and specific definition of research misconduct, whereas Europeans have opted for shorter, general definitions” (p. 2).

As mentioned, the most common unethical behaviour is the overlapping publication, recycling research, or texts, followed by plagiarism and authorship issues. However, the literature also points out other devices. For example, the International committee of medical journals editors has been developed the last forty years a series of recommendations (ICMJE Editors, 2019) in terms of the best practices recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work see in Table 5 the evolution of the

document in terms of the practices, in the last year the main discussion is around authorship, overlapping recommendations and predatory journals.

**Table 5. Evolution of recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work International committee of medical journals editors**

Year	Document	Description
1979	Uniform requirements for manuscripts submitted to biomedical journals	<p>Proposals for a uniform style for the submitted manuscripts contained in the original Vancouver document.</p> <p>Physical properties covered for manuscripts, including paper size; components such as title page, abstract, page numbers, tables, and illustrations; the acceptable content of sections (introduction, methods, and results); acceptable abbreviations (units, statistical terms, substances, and titles of and journal titles); and the submission process.</p> <p>The reference formats were similar to those of Index Medicus. Still, the year of publication followed the journal title, and the closing pagination was shortened, and the end pagination was shortened.</p>
1982	Uniform requirements for manuscripts submitted to biomedical journals	Includes a statement on prior and duplicate publication; other changes were minor.
1988	Uniform requirements for manuscripts submitted to biomedical journals	<p>All persons designated as authors must be entitled to authorship. Each author must have participated sufficiently in work to take public responsibility for the content. Authorship credit should be based solely on substantial contributions to (a) conception and design, or analysis and interpretation of data, and (b) drafting of the article or critical revision of its important intellectual content, and (c) final approval of the version to be published. Conditions (a), (b), and (c) must all be fulfilled.</p> <p>Participation only in fundraising or data collection does not justify authorship. Not is general supervision of the research group sufficient for authorship. Any part of an article that is critical to its main conclusions should be the responsibility of at least one author.</p> <p>Responsible for the article; other persons who have contributed to the work should be acknowledged separately (see "Acknowledgements"). Editors may require authors to justify the assignment of authorship.</p> <p>More clearly defined authorship criteria. The acknowledgments section defined the types of credits and permissions required. Use of the International System of Units (SI) is recommended. The list of abbreviations has been removed. The section on statistics added and the use of confidence intervals emphasized.</p> <p>Retraction of research results. "Expressions of concern. Editorial freedom and integrity Confidentiality. The role of correspondence</p>
1991	Uniform requirements for manuscripts submitted to biomedical journals	<p>Previous and duplicate publication: Multiple publications, i.e., publication of the same study more than once, regardless of whether the wording is the same, is rarely justified. It is the same, is rarely justified. Secondary publication in another language is a possible justification, provided the following conditions are met (1) The editors of the two journals involved are fully informed; the publisher interested in secondary publication must have a photocopy, reprint, or manuscript of the prior version. (2) The priority of the primary publication is respected with a publication interval of at least two weeks. (3) The work for secondary publication is written for a different readership and is not simply a translated version of the primary article; an abridged version is often sufficient. (4) The secondary version faithfully reflects the data and interpretations of the prior version. (5) A footnote on the cover page of the secondary version informs readers, peers, and documentation agencies that competing manuscripts based on the same study Authorship order Guidelines for the protection of patients' right to anonymity of patients' anonymity</p>
1994	Uniform requirements for manuscripts submitted to biomedical journals	<p>Conflicts of interest, acknowledgments.</p> <p>Authorship: All persons designated as authors must be entitled to authorship. Each author must have participated sufficiently in work to assume public responsibility for the content. Authorship credit should be based solely on substantial contributions to (a) the conception and design or analysis and interpretation of the data and to (b) the drafting of the article or (b) the drafting of the article or the critical revision of its important intellectual content and (c) the final approval of the version to be published. Published. All three conditions must be met. Participation only in obtaining funding or collecting data does not justify authorship. Not is general supervision of the research group sufficient for authorship. Any part of an</p>

		<p>article that is critical to its main conclusions must be the responsibility of at least one author. An article with corporate (collective) authorship should specify those primarily responsible for the article; others who have contributed to the work should be acknowledged separately (see "Acknowledgements").</p> <p>Editors may require authors to justify authorship assignments. The order of authorship should be a joint decision of the co-authors. All authors must meet the above-mentioned essential criteria. Since the order of authorship is assigned in different ways, its meaning cannot be accurately deduced unless indicated by the authors. Authors may add an explanation of the authorship order in a footnote. Authors should be aware that many journals limit the number of authors listed in the index in deciding the order. For example, the National Library of Medicine lists only the first ten authors in MEDLINE.</p> <p>The presentation of a paper at a meeting does not constitute prior publication, nor does the presentation of a paper at the meeting. The order of authorship is a joint decision of the co-authors. Words for structured abstracts. The number of authors cited in a reference is reduced from seven to six (plus "et al."). Examples of references greatly expanded from 14 to 34. The list of participating journals has been deleted.</p> <p>The 1993 revision stated that electronic publication was considered publication. Corporate authorship is subject to the same criteria as individual authorship. A section on manuscripts on diskette was added. The 1994 revision review introduced the term publication and described the remedies. The secondary publication was described as acceptable under some conditions.</p>
1995	Uniform requirements for manuscripts submitted to biomedical journals	<p>Increasingly, multicentre trials are attributed to a corporate author. Therefore, all group members named as authors, either in the authorship position below the title or in a footnote, must fully meet the criteria for authorship as defined in the "Uniform Requirements." Group members who do not meet these criteria should be listed, with their permission, in the acknowledgments or an appendix (see Acknowledgements).</p>
1997	Uniform requirements for manuscripts submitted to biomedical journals	<p>Redundant or duplicate publication. Acceptable secondary publication Protection of patients' right to privacy.</p> <p>Acknowledgments: In an appropriate place in the article (footnote to the title or an appendix to the text; see journal requirements), one or more statements should specify (a) contributions that need acknowledgment but do not justify authorship, such as general support from ahead of the department; (b) acknowledgments for technical assistance; (c) acknowledgments for financial and material support, which should specify the nature of the support, and which may involve a conflict of interest. Individuals who have made an intellectual contribution to the work</p> <p>But whose contribution does not justify authorship may be named, and their role or contribution described, e.g., "scientific advisor," "critical review of the study proposal," "data collection," or "participation in the clinical trial." These persons must have given their permission to be named.</p> <p>Authors are responsible for obtaining written permission from individuals cited by name, as readers may infer that they support the data and conclusions. Technical assistance should be acknowledged in a separate paragraph from those acknowledging other contributions.</p>
2004	Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication	<p>Ethical conduct, editorial freedom, privacy and confidentiality, overlapping publications: duplicate submissions, redundant publications, Authorship, and contribution: Authors of articles, List of contributors in acknowledgments. Some journals now also request that one or more authors be identified, called "guarantors," as individuals who take responsibility for the integrity of the work as a whole, from inception to publication of the article, and publish that information.</p> <p>Authorship criteria were revised to include responsibility for "appropriate parts" of the text, not the whole text; one or more authors, not necessarily all must take responsibility for the work as a whole; data acquisition is considered a contribution worthy of authorship; editors were encouraged to publish information about each author's contributions.</p> <p>How and why experimental subjects were selected and why experimental subjects were selected, and more substantial caveats on the use of ethnic descriptors were added. More substantial caveats on the use of ethnic descriptors were added.</p> <p>Stricter criteria for authorship. Conflict of interest statements was considerably expanded, especially those relating to industry funding. A hypertext link to <a href="http://www.nlm.nih.gov/bsd/uniform_requirements.html">www.nlm.nih.gov/bsd/uniform_requirements.html</a> has replaced the section on reference formats</p>



2005	International Committee of Medical Journal Editors	Protection of humans and animals in research obligation to publish negative studies Corrections, retractions, and "expressions of concern" Overlapping publications 1. Duplicate submissions 2. Redundant publication 3. Acceptable secondary publication 4. Competing manuscripts based on the same study a. Differences in analysis or interpretation b. Differences in reported methods or results. Competing manuscripts based on the same database
2006	Requisitos uniformes para los manuscritos enviados a revistas biomédicas: Escribir y edición para la publicación biomédica	D. Conflicts of interest 1. Potential conflicts of interest related to the authors' commitments Individual commitments 2. Potential conflicts of interest related to project support 3. Potential conflicts of interest related to commitments of editors, journal staff, or reviewers journal staff or reviewers E. Privacy and Confidentiality 1. Patients and study participants 2. Authors and reviewers
2007	Uniform Requirements for Manuscripts Submitted to Biomedical Journals: Writing and Editing for Biomedical Publication	Advertising Medical journals and media in general Obligation to register clinical trials
2013	Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals	Roles and responsibilities of authors, contributors, Reviewers, Editors, Publishers, Editors, and Owners A. Defining the role of authors and contributors 1. Why authorship is important 2. Who is an author? 3. Contributors who are not authors B. Author Responsibilities - Conflicts of Interest 1. Participants a. Authors b. Peer reviewers c. Editors and journal staff 2. Notification of conflicts of interest  Authorship confers credit and has important academic, social, and financial implications. Authorship also implies responsibility and accountability for published work. The following recommendations are intended to ensure that contributors who have made substantial intellectual contributions to work receive credit as authors and that contributors credited as authors understand their role in taking responsibility and accountability for what has published their role in taking responsibility and accountability for what is published.  A. Corrections and version control B. Scientific misconduct, expressions of concern, and retraction
2014	Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals Updated December 2014	Responsibilities in the Submission and Peer-Review Process 1. Authors
2016	Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals Updated December 2016	Submission and peer review responsibilities Process 1. Authors a. Predatory journals Predatory journals An increasing number of entities that advertise themselves as "medical journals" do not function as such ("predatory journals"). Authors have a responsibility to Evaluate the integrity, track record, practices, and reputation of the journals they submit their submissions. Of the journals to which they submit manuscripts. Further guidance can be found at <a href="http://www.wame.org/about/principlesof-transparency-and-best-practice">http://www.wame.org/about/principlesof-transparency-and-best-practice</a>
2017	Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals Updated December 2017	1. Authors a. Predatory journals or pseudo-journals Data sharing Predatory journals or pseudo-journals A growing number of entities advertise themselves as "specialized medical journals" but do not function as such. These journals ("predatory" or "pseudo-journals") accept and publish

	<p>almost all submissions and charge article fees, and often inform authors of this upon publication, and often inform authors of this once the article has been accepted for publication. They often claim to peer review but do not and may purposely use names similar to those of well-established journals. They may claim to be members of the ICMJE but are not (see <a href="http://www.icmje.org">www.icmje.org</a> for current ICMJE members), and that they follow the recommendations of organizations such as the ICMJE, COPE, and WAME. Researchers should be aware of the existence of these bodies and avoid submitting research to them for publication. Authors are responsible for assessing the journals' integrity, track record, practices, and reputation to submit their manuscripts. Guidance is available from some organizations to help identify the characteristics of peer-reviewed journals (<a href="http://www.wame.org/identifyingpredatory-or-pseudo-journals">http://www.wame.org/identifyingpredatory-or-pseudo-journals</a> and <a href="http://www.wame.org/about/principles-of-transparency-and-best-practice">http://www.wame.org/about/principles-of-transparency-and-best-practice</a>). Seeking help from scientific mentors, senior colleagues, and others with many years of experience in academic publishing can also be helpful.</p> <p><b>Data sharing</b> The ICMJE's data sharing declaration policy is detailed in an editorial (see Detailed in an editorial (see Updates and Editorials [<a href="http://www.icmje.org/update.html">www.icmje.org/update.html</a>])).</p> <p>1. As of 1 July 2018, manuscripts submitted to ICMJE journals reporting clinical trial results must contain a data sharing statement as described below.</p> <p>2. Clinical trials that begin enrolling participants on or after 1 January 2019 must contain a data sharing statement described below. In addition, after 1 January 2019 should include a data sharing plan in the trial registration. Trial registration. ICMJE's policy on trial registration is explained at <a href="http://www.icmje.org/recommendations/browse/publishing-and-editorial-issues/clinical-trial-registration.html">www.icmje.org/recommendations/browse/publishing-and-editorial-issues/clinical-trial-registration.html</a>. If the data-sharing plan changes after registration, this should be reflected in the submitted should be reflected in statement submitted and published with the manuscript and updated in the registry.</p>
<p>2019 Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals Updated December 2019</p>	<p>e. Diversity and inclusion</p>

Based on the International Committee of Medical Journal Editors (ICMJE, n.d.). <http://www.icmje.org/recommendations/>

Due to this ethical misconduct in producing and disseminating knowledge, several international organizations have started developing good practice guidelines and documents to mitigate ethical risks. For example, a recent joint meeting of the British Medical Journal and the Committee on Publication Ethics (COPE) reaffirmed an earlier definition of research misconduct as “Behaviour by a researcher, intentional or not, that falls short of good ethical and scientific standards.” Furthermore, Journals must provide transparent policies for peer review, and reviewers should conduct studies in an ethical and accountable manner” (COPE, 2017)<sup>22</sup>.

Regarding predatory behavior prevention, Barret et al. (2005)

The equal distribution of guideline awareness and use and group similarities concerning career development and achievement provided us with an opportunity to consider

<sup>22</sup> <https://publicationethics.org/>

whether awareness of and use of guidelines is associated with broader judgments about author roles and responsibilities. The findings suggest that awareness and utilization of guidelines are, at best, only modestly associated with more ethically appropriate judgments and attitudes about author roles and responsibilities. (p. 193)

In the same line, it explains that:

In scientific publications, integrity is considered a value and a virtue, closely related to research ethics. Hence, it places integrity in a broad context of science ethics. Integrity is present as the basis of 'good scientific practices' that should be promoted. Moreover, 'integrity' is frequently associated with the debate about authorship and what it means to be an author in scientific publications, compared to the other media. (Horbach & Halffman, 2017, p. 1481)

Finding mechanisms to mitigate the adverse effects as the moral risk or tragedy of the common from the indicator as a starting point for incentive design scientific production, leading to ethical misconduct, is one of the priorities for the global science and technology ecosystem. It is the challenge of the coming years for academic communities to integrate scientific integrity practices, responsible research innovation, responsible metrics, and programs that promote good ethical practices focused on quality processes rather than on the results of the "indicator for the indicator's" sake.

### **Moral Risk**

As economist Paul Krugman states, moral risk refers to any situation in which one person decides how much risk to take, while another person assumes the cost of things going wrong. (Policonomics, 2020), (Krugman & Wells, 2006); "Numerous economic studies have examined moral hazard effects in workers' compensation. Many have focused on workers' supposed propensity to exercise less caution or file more claims to increase workers' compensation benefit levels. Although many authorities insist that moral hazard is a value-neutral concept, there are often pejorative connotations associated with contemporary discussions of moral hazard that intentionally or unintentionally disparage workers' motives

and undermine public support for workers' compensation programs. (Dembe & Boden, 2000, p. 257)

### Social trap or tragedy of the commons

Describes a situation in which several individuals, motivated only by personal interest and acting independently but rationally, end up destroying a limited shared resource (the common one) even though none of them, either as individuals or as a whole, is convinced that such destruction will occur “The tragedy of the commons is involved in population problems in another way. In a world governed solely by the principle of "dog eat dog"-if indeed there ever was such a world how many children a family had would be a matter of public concern” (Hardin, 1968, p. 1246).

Since Garrett T Hardin's influential article “The Tragedy of the Commons.” At first, many people agreed with Hardin's metaphor that the users of a commons are caught in an inevitable process that leads to the destruction of the very resource on which they depend. Hardin argued that the "rational" user of a commons demands a resource until the expected benefits of their actions equal the regular costs. Because each user ignores charges imposed on others, individual decisions lead to tragic overuse and the potential destruction of an open-access commons. Hardin's proposed solution was "either socialism or the privatize of free enterprise” (Elinor Ostrom, 1999, p. 278), “Using examples from a range of settings, Ostrom showed the ingenuity and resilience of cooperative systems of resource management. Hers has been the economics of the simple majority and not the service of a rich elite. She has drawn on game theory in her more recent work to develop and test a grand institutional design theory. It is complex stuff, but also an uplifting reminder that human behaviour in our capacity to collaborate is so much richer and more creative than the traditional theorists of the dismal science of economics would have us believe”. (Mayo, 2009)



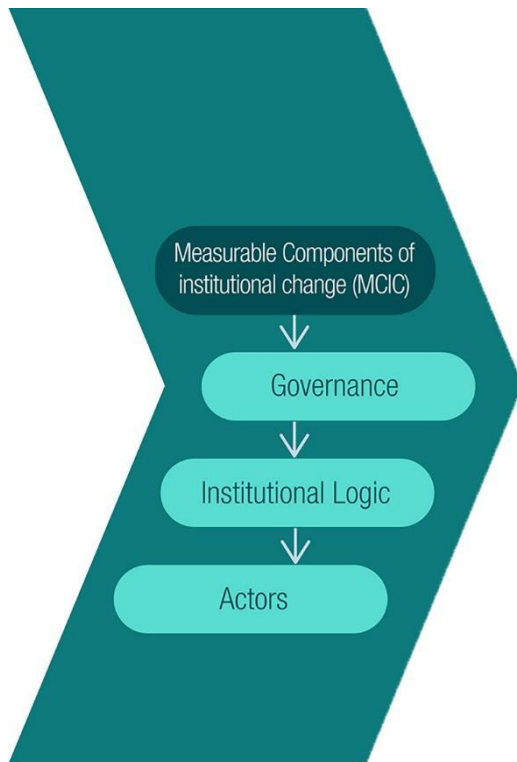
## **4. CONCEPTUAL FRAMEWORK**

## 4. CONCEPTUAL FRAMEWORK

This section presents the conceptual framework used to frame and better understand the dynamics of this problem affecting university research governance. In this study, institutional change was determined using three measurable components (MCIC) (Scott, 2004):

- (i). Governance structures
- (ii). Institutional logics
- (iii). Types of actors and organizational models:

Figure 11. Conceptual Framework map.



This study used an institutionalist approach as the conceptual framework to explain the institutions' internal dynamics, governance, and actors. According to Scott (2004), "Institutional theory considers the processes by which structures, including schemas, rules, norms, and routines, become authoritative guidelines for social behaviour" (p. 2). It "emphasizes the role of rules, norms, and culture in organizational change and explicitly disavows the view that market competition ensures the selection of efficient organizational structures and processes" (Nelson & Winter, 1982).

### *Conceptual Building Blocks*

As mentioned, the three measurable components were used to understand the dynamics of this issue, which begins with international demands, fitted to developed countries, that compel changes in the national scientific journal policy, affecting university and research governance and the actors involved in journal publication, who must respond and comply with these demands according to the institutional logics of the institution to which they belong. For clarity, the following section first describes the approach used, followed by a description of each of the components employed in this thesis.

### *Institutionalism*

Institutionalism bolsters the premise of how higher education institutions in Colombia deal with scientific journal index models by defining specific rules and requirements according to their mission, objectives, and structure. The process to legitimize their model determines specific behavioural outcomes for the associated operation, such as publishing journals within the institutions, publishing in international journals, or using other communication channels, depending on their legitimacy level, prestige, resources, and processes. The institutions' process defines the behaviour of researchers, administrators, and educators at all levels. Thus, the institutional criteria to analyse institutional and individual (research teams or researchers) performance explain university quantitative performance measurements (Frost, 2014, p. 22). Considering the ongoing development of national knowledge production networks in a global context and considering global knowledge networks in national and local contexts (Crow & Silver, 2008).

In light of the theoretical approach to analysing Publindex, the demands and responses of university research and higher education governance are thus understood as “the external and internal coordination of higher education and research.” (Boer & File, 2009, p. 9). Under this framework, this study sets out to understand how the global commodification of scientific production and the corporatization of the business market has pressured national research into an ecosystem where local issues and problematics are subsequently neglected and relegated to the margins of pertinent academic research interests (Kang, 2009, p. 230).

#### 4.1. Measurable Components of institutional change (MCIC)

According to Scott (2004), “In tracking institutional change empirically, we found it advisable to focus on three measurable components— (i) *governance structures* (a combination of regulative and normative factors), (ii) *institutional logics* (primarily cultural-cognitive elements) and (iii) *types of actors* or organizing models (a combination of cultural-cognitive and normative elements)” (p. 22). In addition, charting systematic change over several decades in the types and numbers of actors (individual roles, organizational forms, and their interrelations), like institutional logics. Thus, to understand the dynamics, this study’s theoretical framework considers the following for each measurable component:

- (i). Governance structures: The central governance tensions are the pressure to be part of the citational databases (Wos/Scopus);
- (ii). Institutional logics: Each institution responds according to the organization’s mission, objectives, and values. The internal discourse of the members of the organization is generally coherent with it. However, the composition of the public or private organization generates external pressures for the organization that affect the internal processes and.
- (iii). Types of actors or organizational models: Depending on the role, professional experience, disciplinary background, and personal or professional interests, the answers presented to the tensions have a different argument.



These measurable components, transferred to the case of Publindex, the universities “actors” referred to are

- (i) Governance structures (the institutional regulative and normative framework related with specific incentives of knowledge production and dissemination which are represented in the strategic research plan, mission, vision, values, research and professor statutes related to incentives “bonuses and salary,” incentive and performance approach;
- (ii) Institutional logics, the values, norms, ideas, beliefs, and meaning systems that guide the behaviour of actors (e.g., legal framework –specific decree or regulations- the specific scientific journal system national or international, research cultures, public or private context, explicit norms or behave per area of knowledge);
- (iii) Actors –individuals or organizations (e.g., institutions model who play different roles, associations, external organization, rankings, accreditations, internal units in three levels, macro - meso – micro, managers, research teams, researchers). Regarding the latter, Clemens et al. (1995) stated that there are connections between publication strategy, institutional type, and publication patterns” (p. 451).

Considering the “business market” of the scientific journal publishing context, in terms of the pressures generated by the rankings and international standards generating transformation in research governance in institutions, The following section addresses governance structures.

#### 4.1.1. Governance structures

University Research Governance refers to how institutions are organized and “operated internally,” from the perspective of their governance and management and their relationship with external entities and actors to ensure higher education objectives (Brunner, 2011). It

frames the role of research governance and defines its parameters “from a perspective of internal organizational efficiency influenced by comparison of market and hierarchy to actor-centered institutionalism regarding normative-legal definition institutions and rules” (Jansen, 2007, p. 17). Leisyte (2007) defines university research governance as “Institutional arrangements within universities (e.g., lines of authority, decision-making processes, financing, and staffing),” which depend on external governance that “refers to the institutional arrangements on the macro- or system-level (e.g., laws and decrees, funding arrangements, evaluations) (p. 23)” to define new research agendas and strategies.

The concept of university research governance is understood as: how universities operate internally, based on specific external pressures to “emphasize the role of rules, norms, and culture in organizational change and explicitly disavow the view that market competition ensures the selection of efficient organizational structures and process” (Nelson & Winter, 1982). In this study, the tensions generated in scientific production are examined and how the different case studies respond and operate internally according to their vision, mission, and organizational structure.

Each of these international, national, disciplinary, and internal demands requires governance research units. They include research vice-rector or directions, research groups, and researchers in the different schools and departments, to define guidelines for research policy (regulations, standards, strategic plans, agreements, regulations), organizational structure (functions, personal), allocation of financial, technology, personnel, and infrastructure resources.

Table 6 shows the relationship between university research governance and Publindex, where the governance problems are a product of national and international demands that create policy ambiguity in terms of the lines of authority formal and informal practices, decision-making process to allocate resources, financing over income to define priorities and strategies, and staffing duplication resources.

Table 6. University Research Governance Scientific Journal Index and Policy Instrument Publindex

<b>GOVERNANCE PROBLEMS</b>	Different demands (national and international) related Scientific Journal Index and Policy Instrument Publindex	Lines of authority	Decision-making processes	Financing	Staffing
		Norms / procedures	Division of labour / power relations	Priorities / strategies / procedures	Recruitment criteria / incentives
<b>POLICY PROBLEMS</b>	Policy ambiguity	Formal or informal practice	Define efficiency	Over income	Duplicate resources
<b>COMMON PROBLEMS</b>	Open access vs. copyright; Publish or perish vs. salary (income); Indicators and metrics vs. prestige in specific area of knowledge or geographical community channel of scientific communication.				

The common problems include Open Access vs. Copyright, publish or perish vs. salary (income), intellectual property, inheritance or heritage protection, activities paid with taxes that should be public for public goods, and the exclusion of specific disciplinary communities, such as Social Science, Art, and Humanities, or others, like Gender Studies.

#### 4.1.2. Institutional logics

Institutional logic is the organizational principles that provide working guidelines for the participants; this refers to the mission, vision, values, institutional scientific journal policy, research agenda, performance incentives, research indicators, ethical and research integrity normative. The internal discourse of the members of the organization is generally coherent with this. However, institutions (public or private) are exposed to externally generated pressures on the organization that influence the internal processes, creating institutional complexity when confronted with incompatible prescriptions from multiple institutional logics (Greenwoode, 2011).

This study hypothesizes that each institution responds according to the organization’s mission, objectives, and values. This institutional perspective allows analysing institutions’ behaviour (internal and external stakeholders) concerning the different pressures.

The leading players in Publindex's system are universities. They play different roles in promoting and measuring knowledge production and dissemination performance. For example, university scientific journal publishers publish articles in international arenas, improve the visibility and accessibility of knowledge, promote internationalization (position in the rankings), and determine salary incentives for academic production and performance. These roles are directly related to institutional and organizational practices involving defining policies, mission, vision, functions, and allocating resources.

#### 4.1.3. Actors

Publindex involves stakeholders that are part of the knowledge production development and dissemination of Colombian scientific journals. All of these actors, on different levels, play a role. They function in complying with the macro level-issued external governance policies concerning national accreditation and internationalization programs by the Ministry of Education and research evaluation and measurements by Minciencias, Publindex categorizations, rankings, national and international publishers, international certification, multilateral, and funding organizations.

This study uses a multilevel analysis to reduce the complexity of the many actors and levels involved. Given that

*Policy formulation in these circumstances is not straightforward. There is the increasing pressure on policymakers and strategists to acknowledge, comprehend, and master the increasing complexity of innovation systems (more actors, more aspects, more levels, and so on); help preside over the establishment of an international division of labour in Science and technology acceptable to all actors involved; adapt to changes in the focus of innovation policies between international (growing), national (changing) and regional (growing) levels.” (Kuhlmann, 2003, p. 356)*

The following is the structure of the actors' multilevel analysis used in this study. The actors are divided into the following levels (See Annex 4).

Level 1: The actors in external governance are the publishers, corporations like Elsevier with Scopus database or Thomson Reuters/Clarivate Analytics with Web of Science database, international accreditation, and multilateral and funding organizations at a global level.

Level 2: Includes the national certification councils, the Ministry of Education, and, ultimately, the Scientific Journal Index and Policy Instrument, Publindex.

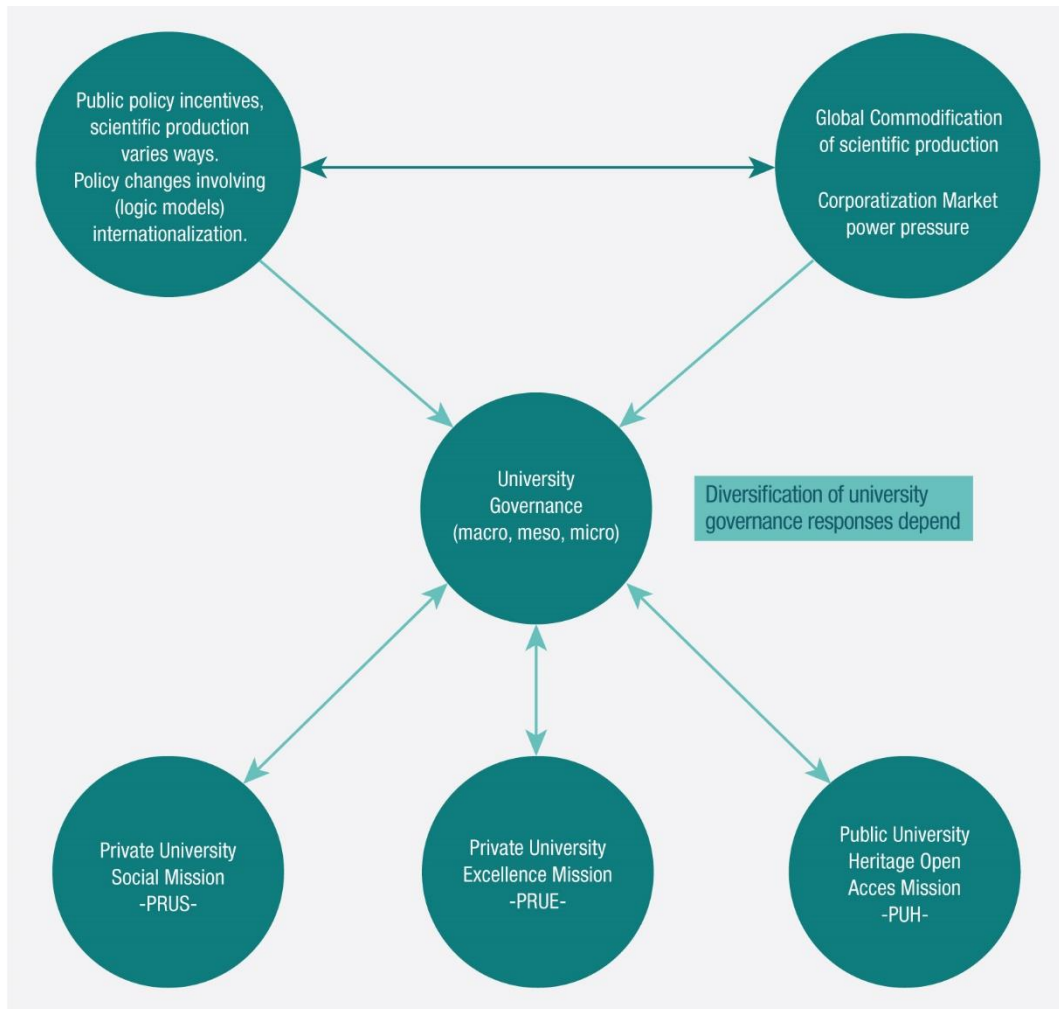
Level 3: Are the actors involved in universities' internal governance. At the macro level, they include the rectors, board, and advisors. At the meso level, they include the Vice-Rector, directors (press, library, and departments), and deans. Finally, at the micro-level are the researchers, editors, and scientific communities.

According to the institution's institutional logic, all actors respond to external governance actors' demands.

In Hazen's (1993) words, "When people in groups organize or are organized to work together to accomplish a complex task none could achieve alone, there are at least as many voices as there are people" (p. 16). Often the voices that are heard are those of the higher echelons of power. The ones that speak the loudest and the lower are disregarded, although they are essential and contribute immensely to the process. By using polyphony, "We discover that each voice, each person in their center of any organization. And it is from each of these dynamic centers that change occurs" (p. 16). Therefore, this study analysed polyphonic organization results to understand the different voices of actors and authorship. Listening to the actors' voices allows understanding the importance of inclusive evaluation mechanisms.

Figure 12 presents the dynamics of international pressures on university governance to illustrate the concept presented in this section and how they are organized in this study.

Figure 12. Dynamics of the international pressures on university governance

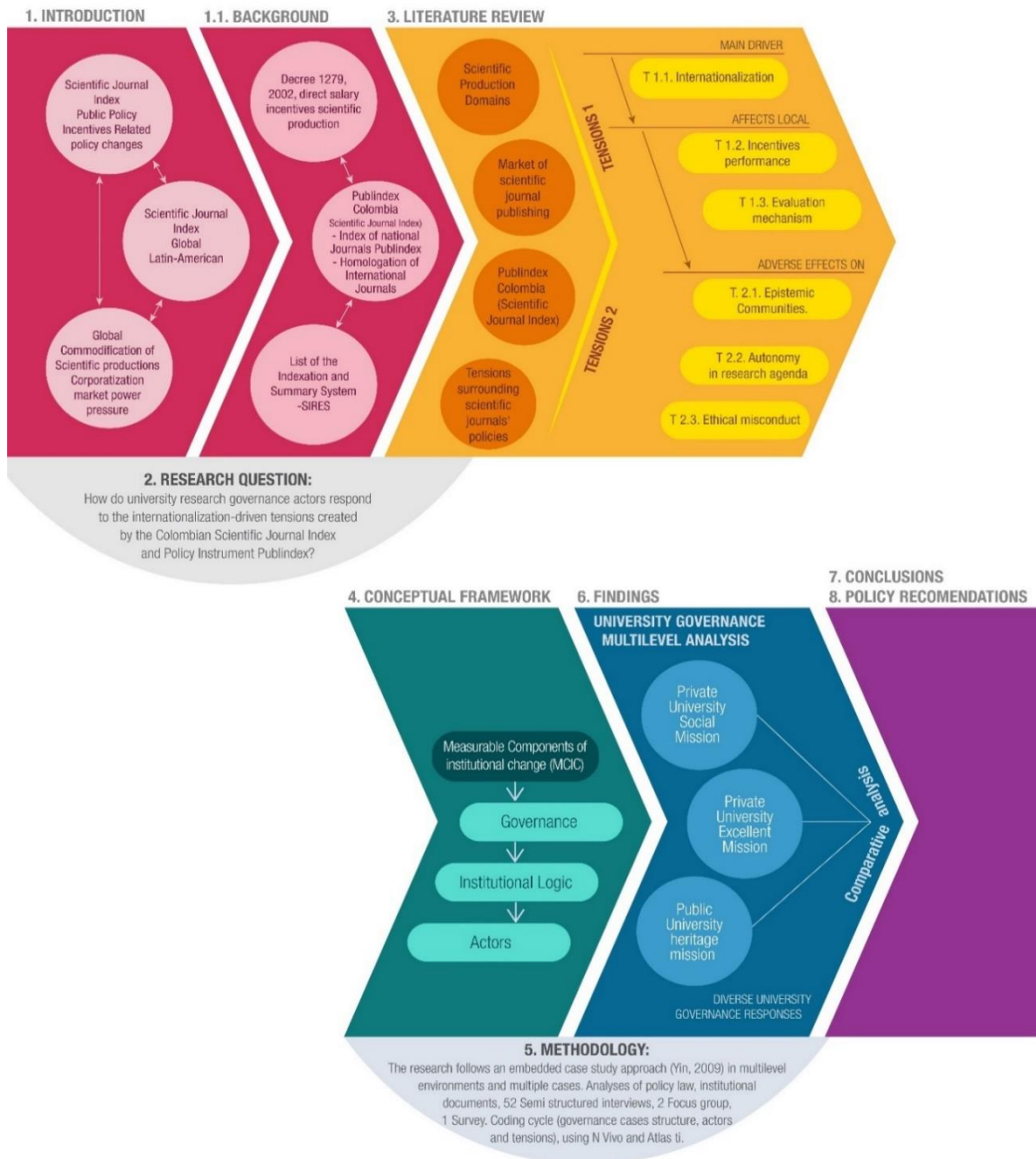


The case studies of three universities (two private [Private University with social mission (PRUS) and Private University with excellent mission (PRUE)] and one public [Public University Heritage mission (PUH)]), within the context of governance, are used as the settings to listen to these voices. The denominations of the universities were made based on the mission that the institutions had at the time of the fieldwork in 2016, which as well as all institutional changes, their missions, governance, policies, and actors have continued to transform over time according to the response that the institutions themselves have given to the dynamics of the environment.

Considering this study aims to understand how university research governance actors respond to the internationalization-driven tensions and Publindex's policy changes and determine the points that should be emphasized to alleviate them, the following figure

is provided to lay out the structure it will follow to understand the tensions on university research governance (Figure 13).

Figure 13. University research governance and Publindex: Understanding the tensions





## **5. METHODOLOGY**



## 5. METHODOLOGY

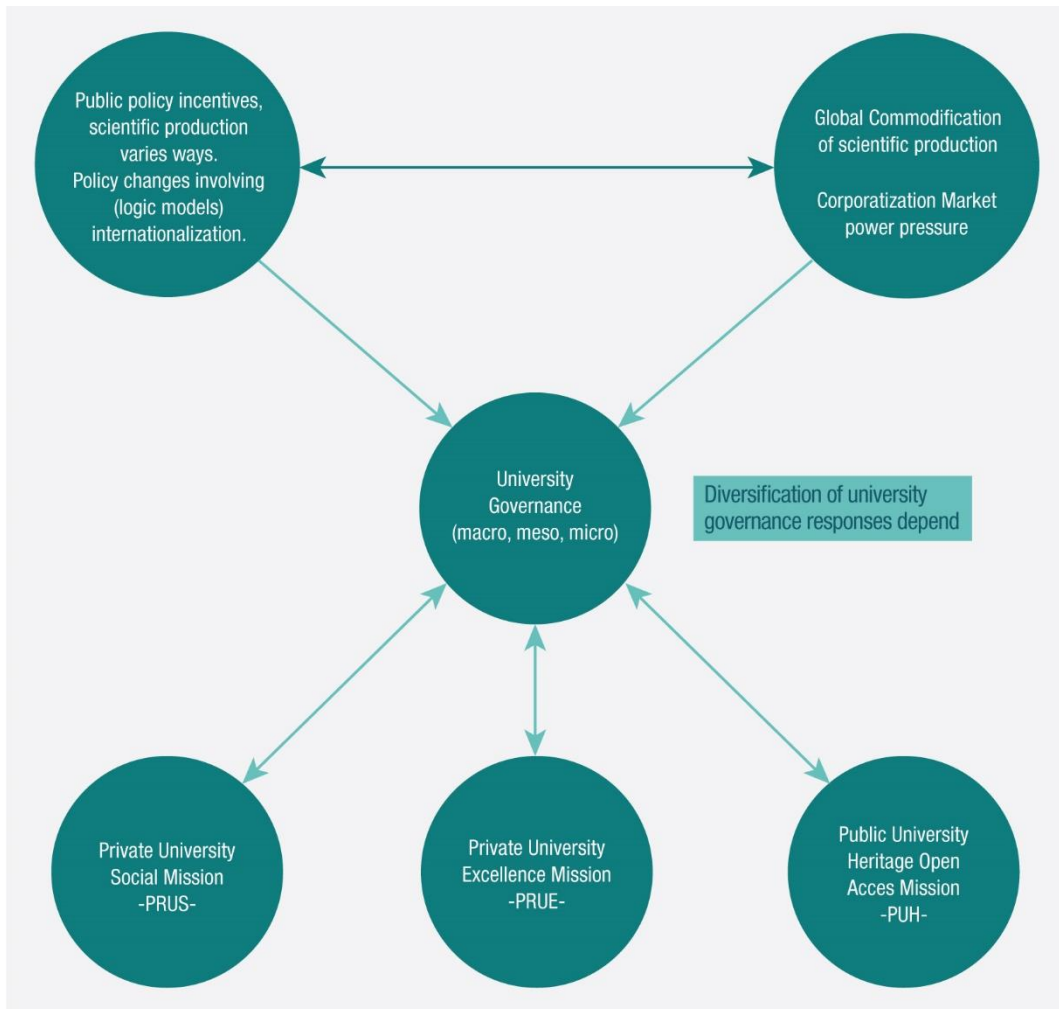
The purpose of this study is to determine how university research governance's actors manage and respond to the internationalization-driven tensions created by the changes in the Scientific Journal Index and Policy Instrument Publindex. The policy regulates national scientific outputs and whether these responses can offer Colombian academic outcomes a more competitive field that considers local and institutional particularities. To this end, this study focused on the following question:

*How do university research governance actors respond to the internationalization-driven tensions and Publindex's policy changes and determine the points that should be emphasized to alleviate them?*

The events concerning the Scientific Journal Index and Policy Instrument, Publindex, provide the background to analyse the changes in university governance and how they affect its actors, who are ultimately responsible for managing the compliance associated with these changes fulfilling their responsibilities to their roles. To determine these roles and interests, these actors were classified using multi-level analysis.

According to Denzin and Lincoln (2005), qualitative research involves studying “things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them” (p. 3). According to each institution's governance, normativity, and specific missions, objectives, and capabilities. Figure 14 is a visual portrayal of the overall dynamic that was used to structure the approach.

Figure 14. Dynamics of the international pressures on university governance



Source: Kuhlmann Stefan, Gonzalo Ordoñez, and María Alejandra Tejada Gómez.

### 5.1. Methods

The premise driving this research is that the introduction of international standards and ranking systems has created tensions that pressure university governance to redefine their indicator as a starting point for incentive design scientific production, research agendas, disregarding national and institutional realities and compelling the actors involved to find ways to comply with these demands and that each institution responds to pressures according to its mission, objectives, and capabilities.

The primary methods to gather empirical data were: assistance to Publindex-related academic events, a survey, 52 semi-structured interviews with different level actors within the scientific journal publishing system, and two focus groups. The information obtained in

the survey and events were used to construct the interviews and focus groups' protocol. The focus group enabled the triangulation of the information collected in the interviews and the survey. These methods helped to understand the dynamics of scientific production in Colombia within the policy's framework and the different organizations and actors' positions on the issues (See Annex 5, 6, 8 13 and 15).

The methods used to construct the protocol were: (i) observations and participation in socialization, debates, conferences, talks, and courses on the new demands of scientific production; (ii) a review of discussions in periodic media, blogs, journals, social networks, press releases, and letters from scientific communities; (iv) a review of policy documents; (v) a review of the literature related to scientific production, built from various bodies of knowledge, such as the Sociology of Science, Philosophy of Science, Governance, Higher Education, and Information Sciences. The analysis of this information supported the premise that external pressures on university governance created tensions. Statements and assumptions were constructed to reflect scientific production controversies. Finally, based on these statements and assumptions<sup>23</sup>, the questions were formulated for the interviews conducted with different level actors within the three selected universities. This data was cross-checked with the data obtained from the two focus groups.

In analysing and codifying the cases and tensions, some positions diverged, and others converged concerning the same tension. Polyphonic narratives were used to hear the different voices of authorship (dominants and peripheral) explain these differences and convergences, contrasting discourses like international vs. local agendas, incentives vs. research behaviour, and evaluation mechanisms (Hazen, 1993). Nvivo<sup>24</sup> and Atlas<sup>25</sup>

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<sup>23</sup> According to Cabinet (1989), there are "three main types of policy assumptions that need to be clarified: a) assumptions on the base of what would happen if there were not an R&D policy or if the R&D policy were different; b) assumptions on the causal links between the inputs and outputs of a policy, and between its intermediate and final objectives; and c) assumptions on factors in the external environment, i.e. outside the Government's direct control which could affect the policy's outcome. (p. 7)

<sup>24</sup> NVivo helps to discover qualitative and mixed methods data. Uncover richer insights and produce clearly articulated, defensible findings backed by rigorous evidence. <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>

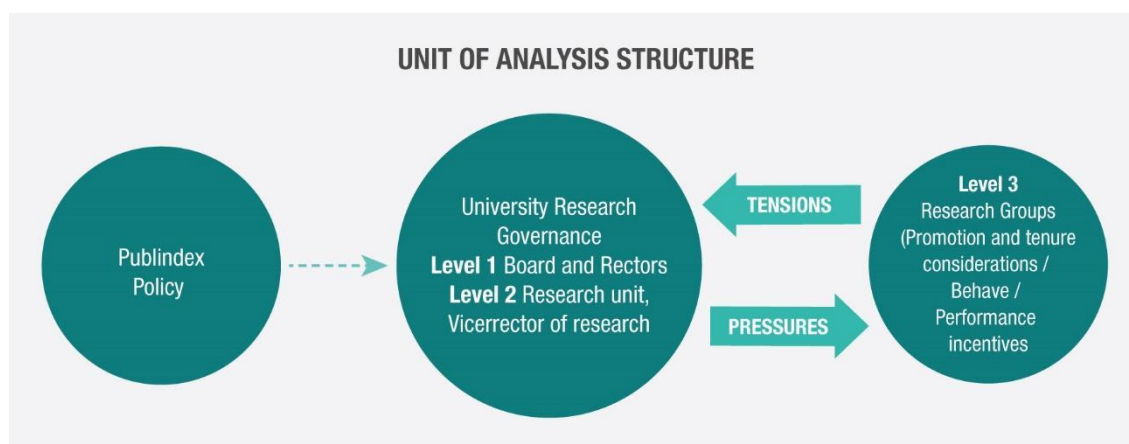
<sup>25</sup> Atlas.ti is a workbench for the qualitative analysis of large bodies of textual, graphical, audio and video data. <https://atlasti.com/product/what-is-atlas-ti/>

software was used to organize, analyse, and find connections and patterns in the data analysis.

## 5.2. Units of analysis

The actors involved in the Scientific Journal Index and Policy Instrument, Publindex, in Colombia were the central units of analysis in this study (Figure 15). At the different levels, and according to the institutional logics of their institution, they play a specific role and function in responding to the macro-level actors' external governance policies, including the Ministry of Education national accreditation and internationalization programs, Minciencias research evaluation and measures, and rankings, national and international publishers, international accreditation, multilateral and funding organization.

Figure 15. Units of analysis



Because it was first necessary to understand all the actors' dynamics within the Publindex system, a multi-level analysis was used to evaluate the types of actors and the combination of cultural-cognitive and normative elements between their roles and functions, in the form of formal and informal relationships concerning the demands of the internal and external scientific production actors such as policymakers, international experts, leaders of scientific associations, rectors, managers, researchers, and scientific journal editors.

At a national governance level, the actors were divided into (i) Macro level: public administration organizations that create the policies, incentives, or platforms for Publindex;

(ii) Meso level: association of research organizations (research centers and universities) who are affected by the macro-level incentives; (iii) Micro-level: the research units, research groups, researchers, libraries, publishers, and communication media units that develop institutional policies to respond to the national policies (Table 7). The actors were analysed to determine their level of involvement in the aspects of university research.

**Table 7. Level of analysis University Research Governance**

<p><b>Level 1</b> Strategic University Boards, Strategic Planning Office</p>	<p>Mission (Values, norms, codes). Research Policy (research agenda, strategic planning, research performance, intellectual property, regulation).</p>
<p><b>Level 2</b> Tactic - Research Unit Vicerrector of research or research directions</p>	<p>Structure - Organigram, coordinated units and actors, lines of authority, decision-making processes. Functions (financing, coordinate through school deans and research committees and staffing). Research Information Systems (inputs - outputs) (CRIS).</p>
<p><b>Level 3</b> Operative, Research teams, centers, institutions</p>	<p>Organizational incentives outputs (knowledge production, dissemination, grants, relevance, prestigious).</p>

In the case study (three different universities), the analysis involved the relationship between, on the one hand, the institution’s research mission, vision, goals, research planning, activities, strategies, and incentives concerning high-quality research performance and scientific dissemination. On the other, it involved the national and international demands as expressed through Publindex in Colombia. The three measurable components of governance, institutional logic, and actors were used to establish the relationship. Table 8 explains the analysis, carried out through the following steps:

- i. University research configuration in terms of governance and institutional logics.
- ii. Actors’ analysis.
- iii. Stakeholder interviews with university research managers/vice-rectors of research, etc.
- iv. Semi-structured interviews with research team leaders, disciplinary-specific cases (science, social science, art) in dissemination channels.

Table 8. Multilevel analysis

MULTILEVEL ANALYSIS	MACRO	MESO	MICRO
<b>ACTORS</b>	Ministry of Education, Ministry of Technology and Information, National Planning Department, Colciencias (Publindex), National Council of Accreditation, Associations (Ascun, Aseuc, IFLA), International Agencies, Publishing Companies, Commercial Data Bases, Ranking systems.	University Boards, Rector, Academic Research Units, Strategic Planning office, Faculties, Ethical Committees, Deans, Departments, Academic and Scientific Committee, Editors, Editorial Coordinator, Researchers. Support Staff (Press, Library, Technological office, printing), Financial and administrative office (budget projection).	Faculty's Departments, Research Teams, Laboratories, Researchers.
<b>ACTORS PROBLEMS</b>	Different goals, missions and interests; duplicate resources and process.	Deal and define organizational policy with the different level actors demands.	Develop action according with the macro, institutional demand, and the specific epistemological, geographical community.
<b>UNIT OF ANALYSIS</b>	Scientific Journals System in Colombia (Publindex).	University Research (Publindex).	Research teams.
<b>DATA</b>	Historical (1994 - 2015) Decree of Ministry of Education, Policy Documents, Publindex Assess to index journals, results of index assess historical. Stakeholders interview and survey.	Institutional policy of scientific dissemination and research performance incentives. University research governance mechanism.	Research teams outputs per specific disciplinary area (Medicine, Biology, Philosophy, Engineering, Art, Literature, Sociology).
<b>WHAT YOU WANT TO KNOW</b>	Policy advocacy coalition, Network Governance power and interest.	The university policy of research performance and dissemination goals and mission to typologies.	Modes of produce and disseminate research.

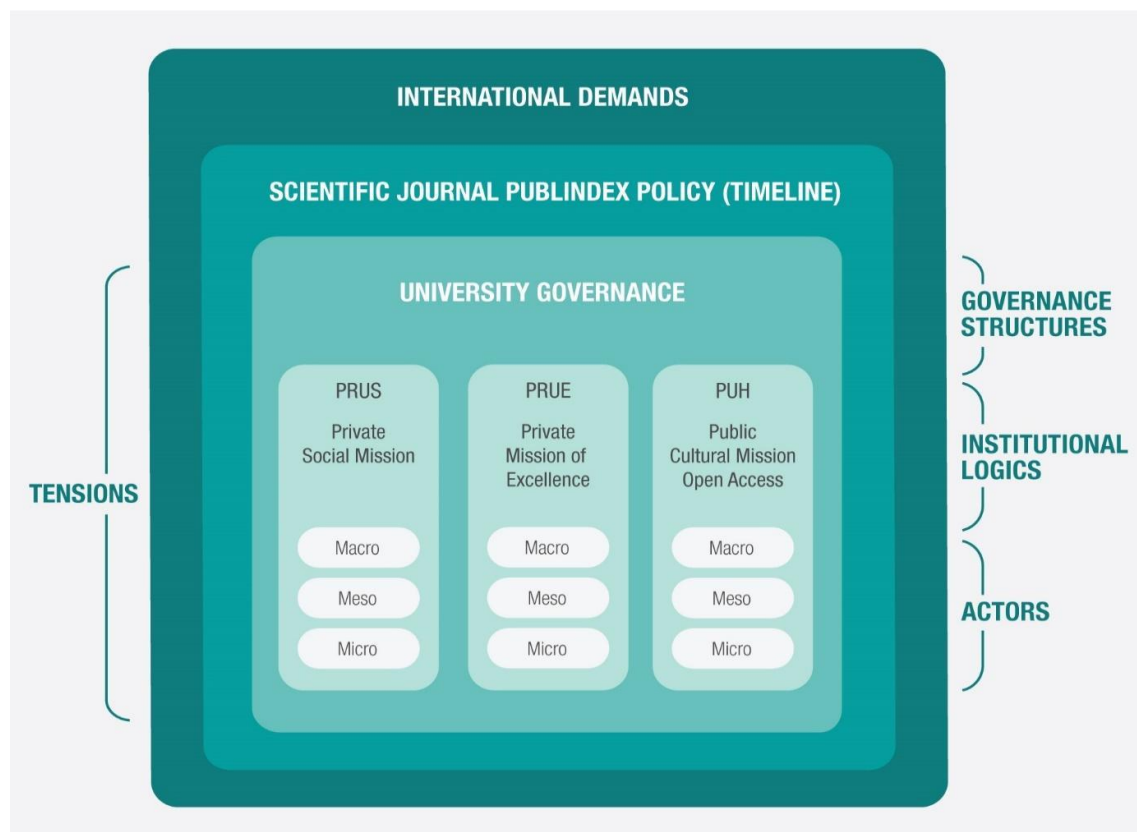
The actors within the higher education institutions were further classified according to the organization's values, mission, and vision. They were identified at the macro-level as the rector's boards and advisors who define the line authority, decision-making processes regarding the institutional policy, and regulatory and normative pillars. At the meso level were the vice-rector, directors (librarians, press, and deans), in charge of developing the institutional research agenda, the research performance incentives, R&D scientific indicators, and ethics research integrity and models in terms of scientific production such as indicator as a starting point for incentive design scientific production or visibility. At the micro-level were the researchers, editors, and the epistemic scientific community, performing and behaving according to the institutional regulations and research performance incentives. These actors were the central units of the embedded case study.

### 5.2.1. Embedded Case Design

The multi-level actor analysis helped to determine the participants in the empirical approach. The universities were selected because of their differences in institutional logic. They provide the background or setting to analyse the actors' responses to the tensions

produced by the Publindex policy. Figure 16 illustrates this embedded case study's structure, which involves the governance structures, the institutional logics of each institution, and the actors' responses to the tensions, following the three measurable concepts of institutional change (MCIC).

Figure 16. Embedded case study structure



*The case study's driving hypothesis is that every organization responds to pressures according to its mission and structure. Hence, the institutions' responses and the actors involved in the process are essential when looking for options.*

### 5.3. Data Collection Methods

The data collected was from various sources, including interviews, focus groups, policy and institutional documents, debates in newspapers, and academic events. However, the fifty-two semi-structured interviews were primary methods to gather empirical data (See Annex 5 to 9. Data Analysis and Annex 14. Interview Quotations).

The fieldwork was carried out from May 2016 to January 2017. During this time, several events took place in the Publindex policy, affecting the phenomena directly. They included (i) the launch of the Publindex policy in May 2016, (ii) the version of the SIRES document in June 2016, (iii) the market movements of Thomson Reuters' sale of WoS, and the purchase of several open-access platforms by Elsevier, and (iv) the Article processing charge –APC- model<sup>26</sup>.

#### 5.3.1. Document Review

The document review carried out before the fieldwork included the following.

- (i) A review of specific policies, laws, regulations, and public documents concerning knowledge production and dissemination in Colombia, Decrees related to salaries, incentives, and performance (Decree 1444 de 1992; Decree 60 de 1995; Decree 15 de 1996; Decree 2912 of 2001 and 1279 of 2002; Law 1286 de 2009).
- (ii) The selected universities analysed institutional documents (institutional research policy –incentives, knowledge production, regulation, indicators). Specifically, the tenure track promotion program for each institution.

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<sup>26</sup> Authors pay a one-time Article Processing Charge (APC) to cover the costs of peer review administration and management, professional production of articles in PDF and other formats, and dissemination of published articles in various venues, in addition to other publishing functions. There are no charges for rejected articles, no submission charges, and no surcharges based on the length of an article, figures or supplementary data. Some items (Editorials, Corrections, Addendums, Retractions, Comments, etc.) are published free of charge. (MDPI, 2021)



### 5.3.2. Observations in the field

Before the beginning of the fieldwork, observations were made during events related to university governance and Publindex policy (See Annex 5). Table 9, Debates on Scientific Journal Policy Colombia 2016, describes the central debates by journal editors around the Publindex instrument. These debates are divided by each editor’s discipline (Basic Science, Social Science, Arts and Humanities, and Scientific Journals Editors). The main dimensions discussed were impact, visibility, quality, assessment, and some theoretical concepts.

Table 9. Debates on Scientific Journal Policy Colombia 2016

DIMENSION	BASIC SCIENCE	SOCIAL SCIENCE	ARTS AND HUMANITIES	SCIENTIFIC JOURNALS
IMPACT	Internationalization.	Impact, local and regional.	Relevant to the area of knowledge.	Scope public institutional objective, national, local or international.
VISIBILITY	Quality of SIRES.	Urged open metrics e. g. alternatives.	Specific metrics per area of knowledge.	Resources and capabilities to increase visibility in enclosed or open access systems.
QUALITY	Academic and economic incentives.	Prestige in a community.	Specificity.	Stability and survival (mergers).
ASSESSMENT	High-level impact, international model.	Impact in our country, when evaluating researchers and their institutions, indicators that provide repositories, platforms and publications in open access, as well as other variables, impact and relevance at the local and regional contexts, to complement international bibliometric indicators, how poorly they reflect traditional production and impact of the production of developing countries.	Impact in the area of knowledge.	Relevance / representativeness to a community.
CONCEPTS	Scientific journals with quality, visibility, impact and potential internationalization are universal regardless of geographic point where editing. It is simple, reproducible, globally competitive.	Cognitive capitalism, instrumental indices speculative model, Gentrification of science, colonialist Unit (scientific bureaucracy).	The recognition of the particularities of the various areas of knowledge when establishing evaluation criteria.	Legitimacy, scientific communication, editorial, scientometrics.

As seen in the Table to the Basic Science editor, internationalization has a significant impact. From this editor’s discipline, they agree with the current indexation system and academic incentives. In terms of assessment, they are following the corporate international indexation model. For them, the most relevant concept is that science must be global because it must be universal, regardless of geographic location, to be reproduced.

From the Social Science scientific journal editor's view, the impact should be local and regional, which has urged metrics to contextualize (responsible, open, and alternative metrics). Quality is more about prestige in this disciplinary community. Social Science publishers do not feel represented in the international scientometric model; they are not represented in the social science areas. Therefore, they have developed other channels of scientific communication in more local and regional areas. They consider that the current evaluation model belongs to a cognitive capitalism form that produces the gentrification of science.

To the Arts and Humanities scientific journal editors, the impact should be relevant to the knowledge; assessment should have greater recognition of the disciplines' particularities.

The scientific journal editors' overall concern is the stability between local journals and the international assessment criteria in the tensions between local and international audiences.

The literature review on articles and journals, policy documents, and conferences (Annex 3) discussed the scientific journal policy in 2016. It was used to identify the main problems and controversial observations. The protocol defining the Colombian scientific production policy Publindex was endorsed; this produced a statement of controversy in all the analyses. The issues presented during these events also laid the foundation for the protocol used in the interviews. The statements have been used to identify the central tensions of the scientific journal indexation system and the Publindex policy instrument.

### 5.3.3. Interviews

The following methods were used for the construction of the protocol:

- i. Observations, participation in socialization, debates, conferences, talks, courses on the new demands of scientific production;

- ii. Review of the discussions in periodic media, blogs, journals, social networks, press releases, and letters from scientific communities;
- iii. Review of policy documents as decrees at the national level and institutional regulations at the universities level;
- iv. Review of the literature related to scientific production, built from various bodies of knowledge such as sociology of science, philosophy of science, governance, higher education, information sciences, and evaluation.

The analysis of these sources produced a list of statements used to establish the central tensions affecting national scientific production. Table 10 shows the statements used in the interview protocol.

Table 10. Statements interview protocol

<b>Statement 1</b>	The policy of Publindex has led Colombian publications to be of low scientific quality and have little visibility and low international recognition.
<b>Statement 2</b>	Indexing systems, such as WoS and Scopus, using the hot topic model, compel journals and institutions to redefine their research agendas, causing them to lose autonomy.
<b>Statement 3</b>	The scientific production policy has systematically ignored the behavior of epistemic communities and invisible schools' development, leading to homogenization and standardization, which has led a coalition of the scientific communities to pressure institutional governance and scientific policy processes.
<b>Statement 4</b>	Citation-based evaluation mechanism policies are centered on databases in which they are marginalized (tip of the iceberg), and knowledge is homogenized (the cited are those on top). Local knowledge, developed by communities in developing countries, is disregarded, promoting its black market or citations.
<b>Statement 5</b>	The Publindex policy and Decree 1279 (2002) have created incentives for university research and scientific production. The researcher's priority is salary increases and not contributing to science or solve local problems. Decree 1279 (2002) and its incentives for scientific production have negatively affected the institutional budget.
<b>Statement 6</b>	The keenness to publish or perish has influenced researchers' behavior and promoted low quality products and ethical problems; for example, recycling, salami slicing, or predatory behaviours.
<b>Statement 7</b>	The ranking system has developed a model that homogenizes universities, disregarding the national, local, and institutional contexts. This limits the development of the institutional actor who responds to local problems.

These statements were analysed using NVivo and Atlas.ti software programs to identify the most common words used in the actor's responses and patterns to develop the list of driving tensions. The tensions are Tension 1. Internationalization, Incentives and

Evaluation Mechanism; Tension 2. Epistemic Communities, autonomy in research agenda, and ethical misconduct.

Fifty-two interviews (52) were conducted from May 2016 to January 2017 in Bogotá, Colombia, at the three universities selected, two private universities and one public. A private university with an excellent mission (PRUE), a private university with a social mission (PRUS), and a public university with a heritage mission (PUH). The selection of the acronyms comes from the analysis of the institutional documents. The actors interviewed included directors, managers, and researchers, and editors. The managers: directors, assistant research directors, library directors, press directors, deans, researchers, and scientific journal editors Table 11.

Table 11. Interviews

INSTITUTION	MACRO DIRECTORS	MESO MANAGERS	MICRO (RESEARCHERS / EDITORS)	TOTAL
Private University Social Mission - PRUS -	3	4	9	16
Private University Excellence Mission - PRUE -	2	3	5	10
Public University Heritage Mission - PUH -	2	4	9	15
Other Key players	3	4	4	11
<b>TOTAL</b>	10	15	27	52

Source: Created by the author

#### 5.4.4. Focus Groups

In January 2017, the two focus groups were conducted (See Annex 6). Ten researchers participated in the first focus group; eighteen managers and editors participated in the second. Their objective was to discuss the main issues related to scientific production. The topics discussed in the focus groups were statements concerning the interview protocol, the state of the scientific output in Colombia, Publindex (pros, cons,

improvements, or recommendations), incentive and bonus systems (inverted triangle), publish or perish, ethics, and scientific integrity, measurements as quality indicators (tip of the iceberg), local or domestic knowledge, citation vs. quality, construction of epistemic communities (invisible schools), disciplinary recognition (center vs. periphery), Open Access vs. restricted access (intellectual property). See Annex 6, Focus Group pictures. The experts in the focus groups' responses concerning the variables explored contributed to the unfolding matrix (Padilla, 1996) of data, which, in turn, allowed the identification of patterns in perceptions.

## 5.5 Data Analysis

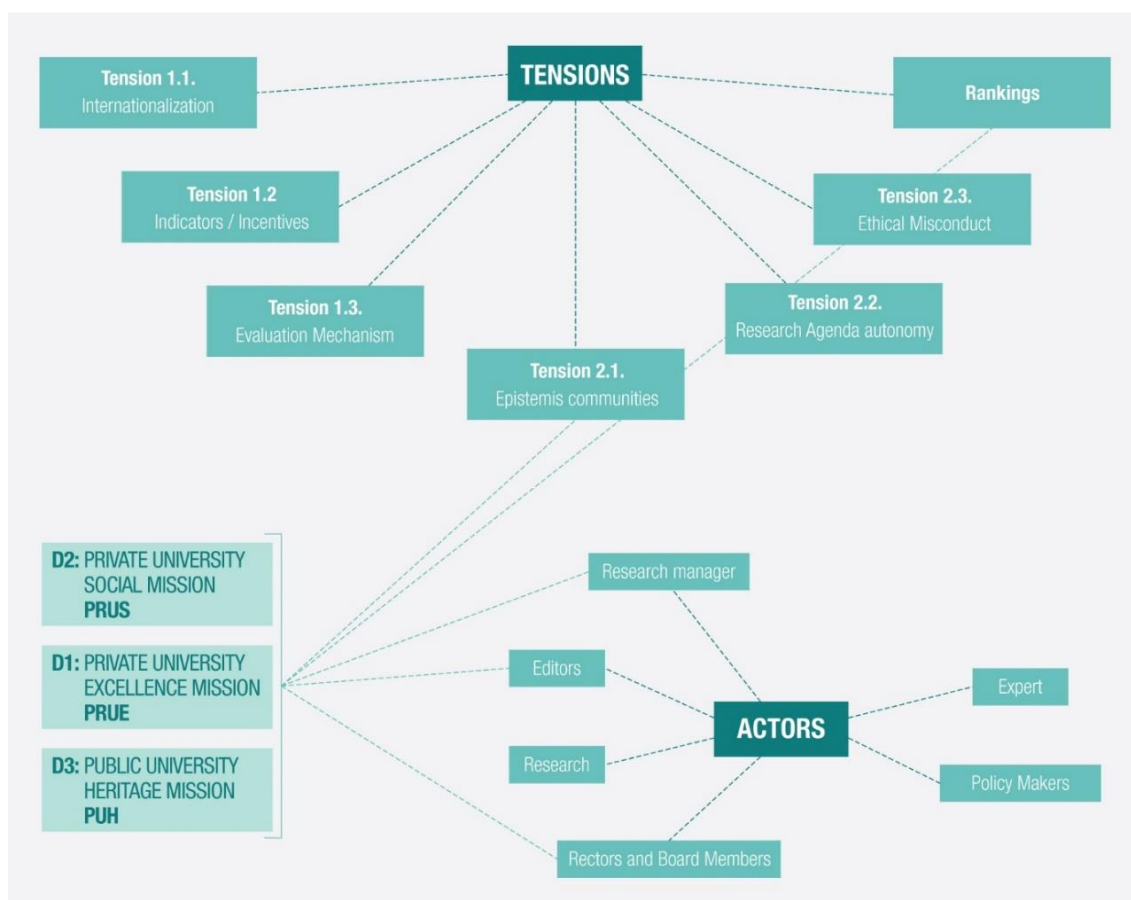
The process of data analysis involved the codification of qualitative data, according to Saldaña (2010). Next, the NVivo and Atlas-ti software organize and find patterns of responses and interaction (See Annex 8 and 9), taking into account the three measurable components of institutional change (Scott, 2004). Finally, the results were analysed using polyphonic organization (Hazen, 1993) to understand different voices.

The first coding cycle involved the governance and institutional logic of the three university cases (PRUS, PRUE, and (PUH)). The second category was organized by the actors' organizational model, including experts, policymakers, rectors, researchers, and editors. Table 12 summarizes the categorization structure and the methods used to obtain the pertinent data.

Table 12. Coding categorization and method

CODING	L1	L2	L3
Type of actors or organizing models	ASCUN, ASEUC, Rectors, Boards, support group, advisers, consultants.	Research or academic unit, strategic planning unit, university press (publishers), libraries, communication and technology office.	Faculties, departments, centers, research teams, researchers, editors, disciplinary associations, funding organizations.
Institutional logics (tactic and operative)	Policies and decrees, decision-making processes.	Regulations, norms, decrees, performances incentives, bonifications.	Schemas, rules, norms and routines, become established as authoritative guidelines for social behaviour.
Governance structures (strategic)	Mission, research policy.	Research strategic plan, organigram, indicators.	Functions.
Actors problems	External governance, which refers to the institutional arrangements on the macro- or system-level (e. g. laws and decrees, funding arrangements, evaluations.	Define new research agenda and strategies.	Prestigious, performance, contribution, disciplinary or social contribution, geographical pertinence.
Unit of analysis	Rectors, boards.	Research or academic unit.	Leader research teams in Business, Philosophy, Biology, Art.
Data quantitative	Semistructured interviews, minutes, mission, vision, goals, research policy.	Research strategic plan, organigram, performance incentives and bonification regulation.	Publication behaviour (good journal - scientist). What do you consider a good journal? Ideal way of publishing? Quality, visibility, accessibility.

Figure 17. Coding cycle (governance cases structure, actors, and tensions)



Source: Created by the author, data analysis Atlas.ti.

The overall structure of the coding cycle to correlate the institutional logics of the universities, governance structures, and actor roles with the tension is shown in Figure 17.

The data obtained during the events, interviews, and focus groups were analysed using Atlas-ti and NVivo to find emerging categories, which were, ultimately, the bases of the main statements, which guided the establishment of the tensions analysed. These were correlated with the most general statements (Table 13), resulting from the empirical information collected.

Table 13. Correlation of statements and tensions

TENSION	SUBTENSION	TITLE	STATEMENT
Tension 1.	Tension 1.1.	Internationalization	<p><b>Statement 1.</b> The policy of Publindex has led Colombian publications to be of low scientific quality and have little visibility and low international recognition.</p> <p><b>Statement 7.</b> The ranking system has developed a model that homogenizes universities, disregarding the national, local, and institutional contexts. This limits the development of the institutional actor who responds to local problems.</p>
	Tension 1.2.	Indicators / Incentives	<p><b>Statement 5.</b> The Publindex policy and Decree 1279 (2002) have created incentives for university research and scientific production. The researcher's priority is salary increases and not contributing to science or solve local problems. Decree 1279 (2002) and its incentives for scientific production have negatively affected the institutional budget.</p>
	Tension 1.3.	Evaluation mechanism	<p><b>Statement 3.</b> The scientific production policy has systematically ignored the behavior of epistemic communities and invisible schools' development, leading to homogenization and standardization, which has led a coalition of the scientific communities to pressure institutional governance and scientific policy processes.</p>
Tension 2.	Tension 2.1.	Epistemic communities	<p><b>Statement 4.</b> Citation-based evaluation mechanism policies are centered on databases in which they are marginalized (tip of the iceberg), and knowledge is homogenized (the cited are those on top). Local knowledge, developed by communities in developing countries, is disregarded, promoting its black market or citations.</p>
	Tension 2.2.	Research Agenda autonomy	<p><b>Statement 2.</b> The policy of Publindex has led Colombian publications to be of low scientific quality and have little visibility and low international recognition.</p>
	Tension 2.3.	Ethical misconduct	<p><b>Statement 6.</b> The keenness to publish or perish has influenced researchers' behavior and promoted low quality products and ethical problems; for example, recycling, salami slicing, or predatory behaviours.</p>







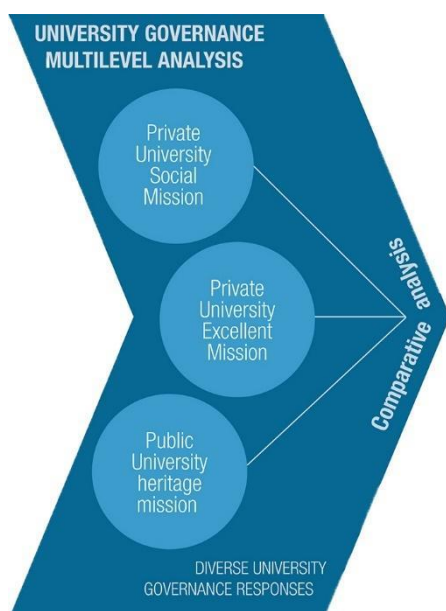
## **6. FINDINGS**



## 6. FINDINGS

This section presents the findings based on the data obtained, including the correlation between the statements and tensions and the actors' responses within each university environment, studied, following the three measurable concepts of institutional change. A cross-case analysis followed this to determine convergence points and identify key lessons to determine the focus factors that should be considered to alleviate the existing tensions.

Figure 18. Finding Conceptual Map.



This study examined how the complex global research production and communication environment pressure national science, technology, and innovation systems to fully participate in the international scientific arena. Decision-making at the national system level may impose pressures on institutional and individual actors to comply with requirements that could conflict with local and institutional contexts and realities. This dissertation looks at the case of Publindex, the Colombian Scientific Journal Index and Policy Instrument, *and* how it affects university research governance. Through a bottom-up approach (actor's voices), the purpose is to evidence the central pressures created by Publindex and how different actors representing different contexts and viewpoints respond to those pressures. The ultimate goal is to provide policy recommendations to incorporate

national, local, and institutional singularities into the policy and Colombian participation in the global scientific endeavour. The driving research question was:

*How do university research governance actors respond to the internationalization-driven tensions and Publindex's policy changes and determine the points that should be emphasized to alleviate them?*

This chapter on findings integrates the background, literature review, problem statement, methodology, and conceptual framework in three institutional cases. First, a case comparative analysis; second, three case studies are analysed based on the conceptual framework of the three measurable components of institutional changes governance, institutional logic, and actors, where the response of the institutions to the pressures of scientific production is revealed.

The three cases are a private university with a social mission, a private university with a mission of excellence and internationalization, and a public university with a heritage mission. This reveals how universities organize university governance to respond to scientific production policies. Finally, a comparative case study is made concerning the three measurable components of governance, institutional logics, and actors; about the tensions of the scientific production policy, a comparative matrix is made with the three case studies, which can serve as a dynamic tool for self-evaluation with scientific production to determine where capacities/capabilities need to be reinforced.

### **6.1. Institutional cases.**

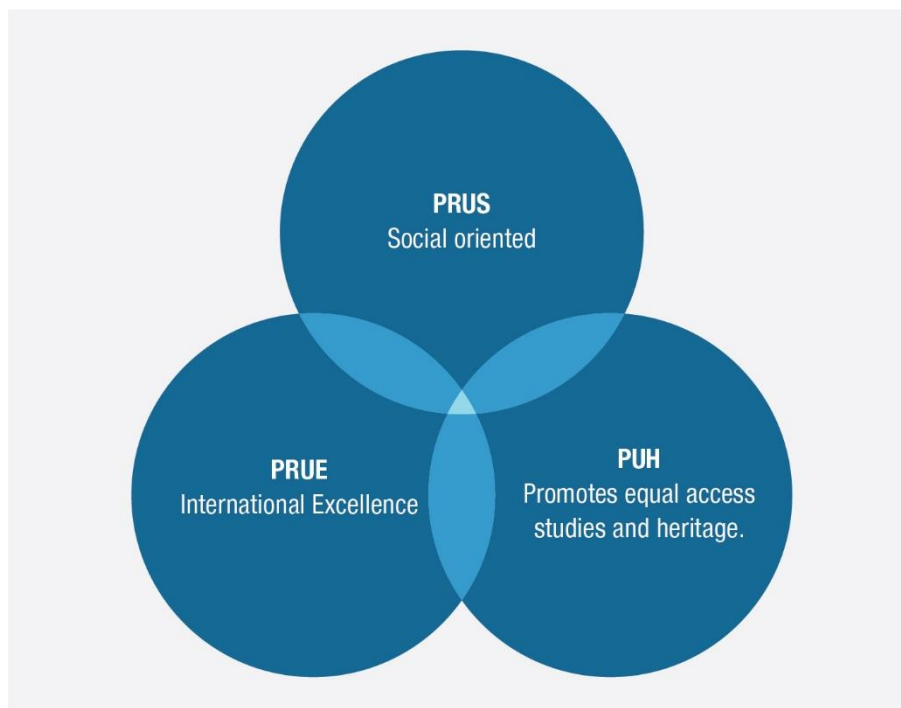
This section analyses three measurable concepts of institutional change (MCIC) (Scott, 2004): governance, institutional logic, and the actors' responses from case study's Colombian Scientific Journal Index and Policy Instrument Publindex tensions.

The case study followed the premise that depending on the organizational principles that provide working guidelines for the actors, and their role, professional experience,

disciplinary background, personal or professional interests, the answers presented to the tensions have a different argument or narratives. There are rather opposite arguments for the same tension, but equally valid from their interests.

They analysed three universities, following its mission and institutional policy document, the following names have been chosen: a private university with a social mission (PRUS), a private university with a mission of excellence (PRUE), and a public university with a heritage mission (PUH) to determine how university research governance is affected and how these institutions, as well as their actors, respond to the tensions produced by the scientific journal policy of Publindex in Colombia (the Colombian scientific journal index and policy instrument Publindex), see figure 19 show The universities to be studied are named according to the mission stated in their institutional bodies and policy documents at the time of the fieldwork in 2016, where the interviews were carried out; it is essential to note that as part of the changes in the institutional logic, this mission has been changing over time.

Figure 19. University cases



### **Private University Social Mission (PRUS)**

This private university is one of the oldest and most traditional institutions with 22.000 students, 190 academic programs, 3.040 academic staff, ten scientific journals in the top scientific databases (Wos and Scopus) with a good position in the rankings 28 Journals index in Publindex. Its social mission is its primary goal. It is aware of the academic regulation regarding the institution's scientific production regarding the promotion incentives. For that reason, they develop a specific committee to analyze the incentives and define better regulation.

### **Private University Excellence Mission (PRUE)**

Founded in 1948, the independent university was created by the academic elite in Colombia with 20.000 students, 150 educational programs, 650 full professors, 70% with Ph.D. (high rates in the country), the top in international accreditation, and a better quality global position in the ranking.

### **Public University Heritage mission (PUH)**

It was founded in 1867 as the country's largest higher education institution with more than 50.000 students, 430 academic programs, 3.000 full-time professors. By volume is the number one in all rankings in Colombia university positions. It has developed the open access institutional repositories recognized in web metrics rankings as the best in the country concerning scientific production. In addition, it has edited more than 50 scientific journals. The scientific production in Wos, Scopus, and Google scholar is the top one in the state. For that reason, they are the most productive institution in terms of scientific articles and journals.

## 6.2. Institutional cases.

### Following the three measurable concepts of institutional change (MCIC): Governance, Institutional logic, and Types of actors

#### 6.2.1. Private University Social Mission (PRUS)

The following section explains the governance, institutional logic, and the actors who respond to the tensions in the PRUS institution's case (see Annex 10. Private University Social Mission (PRUS)).

##### 6.2.1.1. Governance (PRUS)

The governance of this institution has been given by seeking a balance between international and national demands. This institution was born with several institutional journals evolving to scientific journals over time and national demands. The national indexing criteria, which have increasingly demanded international indexing criteria, have required larger budgets, personnel, and strategies to index the journals in these systems, with the inclusion of data in Open Journal System, Publindex, markings in SciELO, Red Alyc, and visibility strategies to improve in the quartiles within WoS and Scopus.

The increasing numbers index generated over cost in terms of production of the journals and salaries incentives. This phenomenon has generated from the directives a budgetary concern in terms of whether the volume of journals could reach the highest levels in the international quartiles, as this denotes a strategy of internationalization, academic marketing, as well as the use of academic and social networks that allow making visible the scientific production produced in the journals. This financial, human resources, and the technological situation has led to review the relevance of having a high volume of journals indexed in the highest quartiles of international systems. The phenomenon occurring is that the journals that do not achieve these indexing levels do not have more support to continue operating, often with detriment in communities with a tremendous patrimonial value in the national context or particular disciplines case of urban planning journal.

The logic of the indexing processes and the positioning in the rankings of institutional journals. In 2007, the coordination of scientific journals was created as an initiative of the academic vice rector's office to support institutional journals' indexing, which achieved good national and international indexing results.

The incentive model was based on the journals indexed in the national, regional, and international indexing systems; the increase in the number of indexed journals led to an increase in the salaries of some areas of knowledge that previously did not have indexed journals, such as theology, law or literature, which led to a concern in budgetary terms and a rethinking of the model.

In 2009, when the Ministry of Education policy was developed about internationalization, where the source of analysis is concentrated on Scopus data, the university continued to have low representation in this international indexing system. Leads the institution to rethink the governance structure, (i) the number of institutional journals indexed about the budget to achieve high levels of indexing in international systems; (ii) the incentive model focused on national or local journals, with a debate towards a model of incentives for publication in international journals.

#### *6.2.1.2. Institutional logics (PRUS)*

According to national and international demands regarding the institutional logic regarding organization's regulations, the academic development incentives have been under constant review and transformation. The review of these incentives is carried out in committees of experts integrated by all the faculties where the best possibilities are discussed according to the faculties' development.

The first regulation in 1985 started with incentives for teaching. In 1997, a new model promoted research and scientific production to give incentives and salary points to publish in Wos, Scopus, Red Alyc, SciELO, and specialized databases. In 2018, the committee evaluated the model to respond to other incentives per area of knowledge and



the main social impact goal, the indicators for assessing in quantitative and also qualitative the results of academic performance, who consider specifiers per measurements and another kind of impact as the social, contextual or regional. Perhaps the constraint about the evaluation research group and journals aligns with the top quartile in Wos and Scopus, which is the way to evaluate research institutions.

Research is considered a strategic activity for the fulfilment of its fundamental purposes. The University statutes, Mission, and Educational Project, give it a leading role in achieving its aims. The Mission identifies research and teaching and service excellence, as one of its three strategic activities, within the framework of an integrated university in a country of regions, with a global and interdisciplinary perspective. It conceives the creation and development of knowledge and culture in a critical and innovative mindset to achieve a just, sustainable, inclusive, democratic, supportive, and respectful human dignity.

Research adheres to the fundamental ethical principles of respect for human dignity, the environment, and the communities it advances. Research involving human beings or experimentation on living subjects or products derived from them ensures compliance with the competent authorities' ethical, scientific, technical, and administrative standards.

For the University, research is the search for knowledge that extends the frontiers of knowledge and its application, shared by the different scientific communities. This search is obtained through differentiated and autonomous processes, according to the nature of each discipline. For this reason, to respond to the diversity of knowledge, the Vice-Rector's Office has three areas of competence: Research Management, Innovation Management, and Assistance for Artistic Creation.

Focused the first academic regulation on strengthening teaching to achieve this commitment. A second regulation was created in which the purpose is to stimulate scientific production; in 2017 document came out in which each of the schools makes a stimulus program according to the realities of discipline and environment. To develop a

compensation model differentiated and contextualized to disciplinary and country facts, focus on international standards as Wos and Scopus production.

A mission aimed at solving the social problems of the country has characterized this University. Scientific production has been developing through a series of institutional journals.

Since the creation of the Publindex program, scientific journals began complying with the national rules of indexing; by 2006, there were six journals indexed in Publindex. By 2014, 28 journals had been indexed in the national program. Henceforth, participated in international indexations with information systems such as Web of Science, Scopus, and indexing systems and summary specialized by areas of knowledge such as Philosopher Index, Econlit, Chemical Abstract, Arxiv, etcetera. In addition, it allowed the institutional and faculty accreditation programs since one of the accreditations' requirements is institutional journals.

This institutional bet of indexation brought by consequences: increases in budgets and resources of personnel editors, editorial assistants; technological advances for the use of platforms of editorial management like Open Journal System; financial constraints for the indexing and marking in systems like SciELO and Publindex, index process generated duplicate resources to index in many scenarios as SciELO, Red Alyc, Wos, Scopus, Google Scholar, and others per discipline.

The internationalization program developed by the Ministry of Education in alliance with SCImago –Elsevier-, using the Scopus database showed higher education institutions in Colombia had no scientific production. The only visible scientific output was from the journals that had reached indexation in these international systems. The national scientific show was in the Publindex database and the national and international repositories. In the case of this institution, in 2009, there were around five journals indexed; in 2014, it had 14 journals indexed in the Scopus system.

The coexistence of scientific production policy programs such as the Publindex program, national and international accreditations, rankings research indicators, and internationalization has created incompatibility within the institutional policies. In principle, the Academic Vice-Rectorate worked with the Publishing House to create Periodical Publications in 2007, supporting academic publications' editorial and indexing processes, successfully indexing 22 journals before Publindex and 14 before Scopus.

The internationalization program from the Ministry of education in 2009 generated two effects: the first one, the academic internationalization of the scientific production within the incentives. Second, the indexation of the institutional journals of atypical areas like theology, law, arts, literature, and history increased the researchers' salaries, and the budgetary increasing, due to journal indexing to institutional incentives. For this reason, in 2010, a revision of the academic regulations was initiated in which new scoring parameters were included as incentives for scientific production, taking into account the databases of Wos and Scopus, Redalyc and SciELO, and Publindex; giving an inclusive approach to the national and Latin American systems.

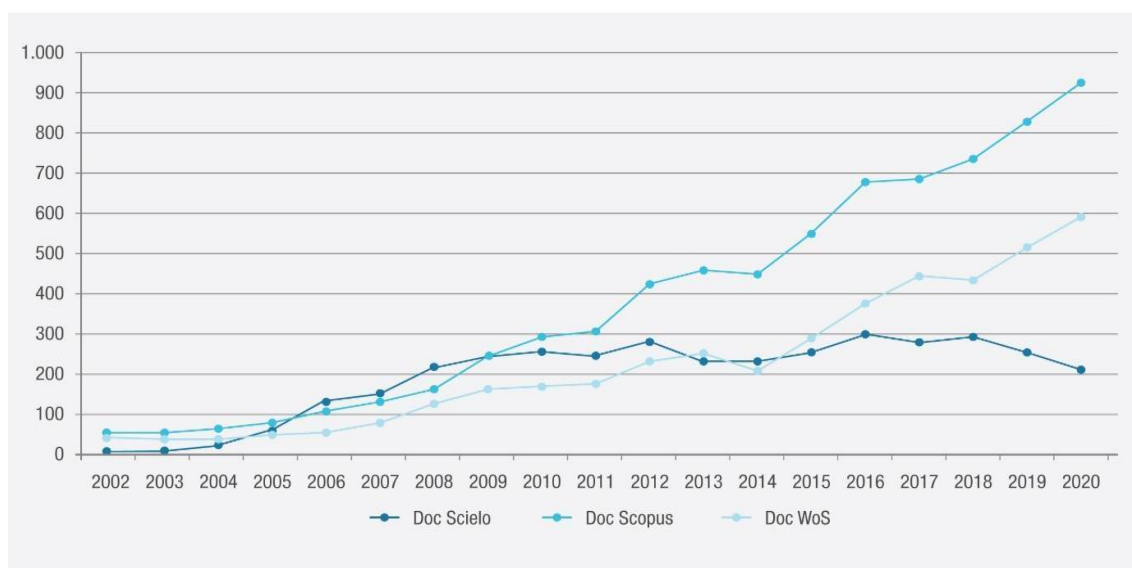
The regulation of academic performance is the institutional policy instrument; it developed an institutional regulation in 1998, which focused on improved teaching; in 2011, focusing on the investigation from the scientific article indexed in the indexation systems; in 2020, focusing on internationalization from Wos and Scopus, and new parameter from leadership and impact.

The regulation in 2018 focused on fulfilling the directives of Minciencias of internationalization, prioritizing the quartiles in Wos and Scopus databases, including with less weight other forms of production by area of knowledge. On the other hand, the faculty's development policy provides the academic promotion with some directives that are not regulations in search of the professional trajectory that has to integrate components of teaching, research (scientific production, innovation, and artistic creation) extension.

In 2020 a new framework for assessing academic performance “The University currently recognized the Web of Science (WoS) and Scopus indexing and the abstracting system as will be seen below, in the areas of arts, humanities, and social sciences, faculty councils may submit for consideration by the Academic Council the inclusion of some high quality and impact journals of high quality and impact that are not indexed in the indexing and abstracting systems recognized by the University” (Universidad, *Marco para la valoración de la trayectoria académica de la planta de académicos*, 2020, pág. 5).

Figure 20 shows the evolution of the scientific production of the institution PRUS, where the scientific articles in Scopus increased in the last decade, and the scientific articles in SciELO decreased.

Figure 20. Productivity in SciELO, Scopus and WoS PRUS 2002-2021



Source: Created by the author SciELO, Scopus, and WoS data.

### 6.3.1.3 Actors responses private University Social Mission (PRUS)

This institution interviewed sixteen people: three directors, four managers, seven researchers, and two editors. Annex 8 describes the actors' composition regarding the academic level, professional background field, and citation level in google scholar. Managers and researchers have doctoral degrees, and managers have master's degrees.

Editors are divided between masters and doctoral degrees. Managers and directors have lower citation levels, researchers and editors have higher citation levels.

Regarding institutional logic related to the tensions, the main frictions maintain the institution's internal journals with the new internationalization regulations. Secondly, the inequality in re-conceiving the forms of production of areas such as social sciences and arts. Below are the actors' responses by tension and by level in the organization.

According to the interviews, the main frictions are incentives and autonomy in the research agenda. Researchers and editors frequently feel a lack of understanding of the educational and scientific processes of the managers and directors. In addition, the editors mention the lack of recognition of their work as editors within their workload and as part of the academic career's incentive models (Table 14).

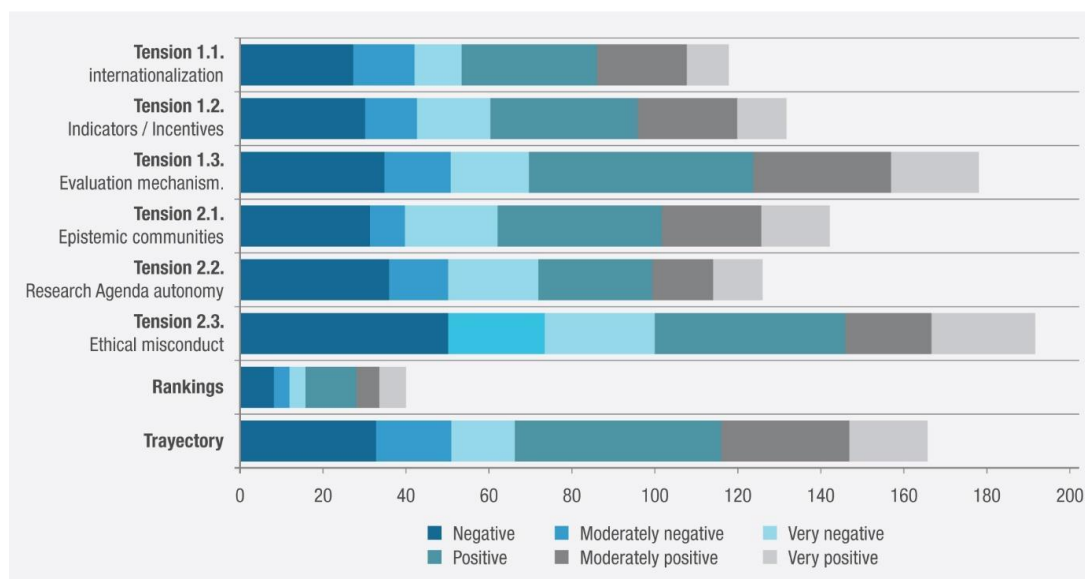
Table 14. Tensions in (PRUS)

PRIVATE UNIVERSITY SOCIAL MISSION - PRUS	COUNT	PERCENTAGE
<b>Tension 1.1.</b> Internationalization	17	13
<b>Tension 1.2.</b> Indicators / Incentives	25	19
<b>Tension 1.3.</b> Evaluation mechanism	22	17
<b>Tension 2.1.</b> Epistemic communities	15	12
<b>Tension 2.2.</b> Research Agenda autonomy	24	18
<b>Tension 2.3.</b> Ethical misconduct	16	12
<b>Rankings</b>	11	8
<b>Totals</b>	130	100

Source: Created by the author with Atlas.ti, based on semi-structured interviews.

In Figure 21, analyse through Atlas.ti the interview narratives about the tensions, the tension with more negative perceptions are evaluation mechanism and ethical misconduct.

Figure 21. Institutional logics (mainly cultural-cognitive elements) tensions, PRUS



Source: Created by the author, Atlas.ti.

## Tension 1. Assessment factors

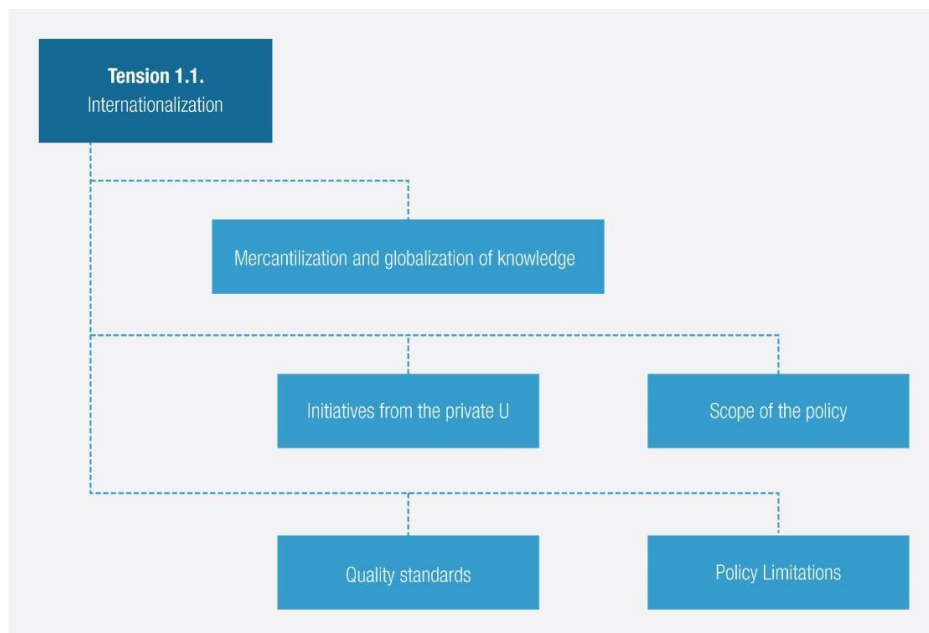
### Tension 1.1. Internationalization (PRUS)

The principal remarks are the scope and limitation of the policy to frame quality standards? One of the recommendations is the conceptualization of the politics of knowledge. Some interviews consider that knowledge systems' production has been marketed in the globalization of knowledge (Figure 22).

The Director at the rector level mentions: "Publindex- we do not know with absolute clarity the purposes thereof; we do not know if it is an option of political strategy for government-oriented allocation of resources for research or assignment of scores for citations." In the same direction, the Library Director considers:

From the point of view of policies, we are more like imitators. We imitate what happens. We adopt strategies and policies from other environments. We are very supportive because we had a recent period of solid international support by experts but with a very commercial orientation, which is unsuitable for the country.

Figure 22. Internationalization Scientific Journal Index and Policy Instrument Publindex, PRUS



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

In the literature, this is allomorphism (Vaira, 2004) or isomorphism (Kein, 2014).

Research in Social Science: “I do not believe that there is a reliable, clear policy in the long term. They are deeply harmful to the dynamics of knowledge production, circulation of knowledge of communities located in a context such as Colombia, by definitions that exceed them and that they hardly understand, for example, a conceptualization of the politics of knowledge (Kuhlmann, 2016) mention the role and goal to define precise evaluation mechanism.

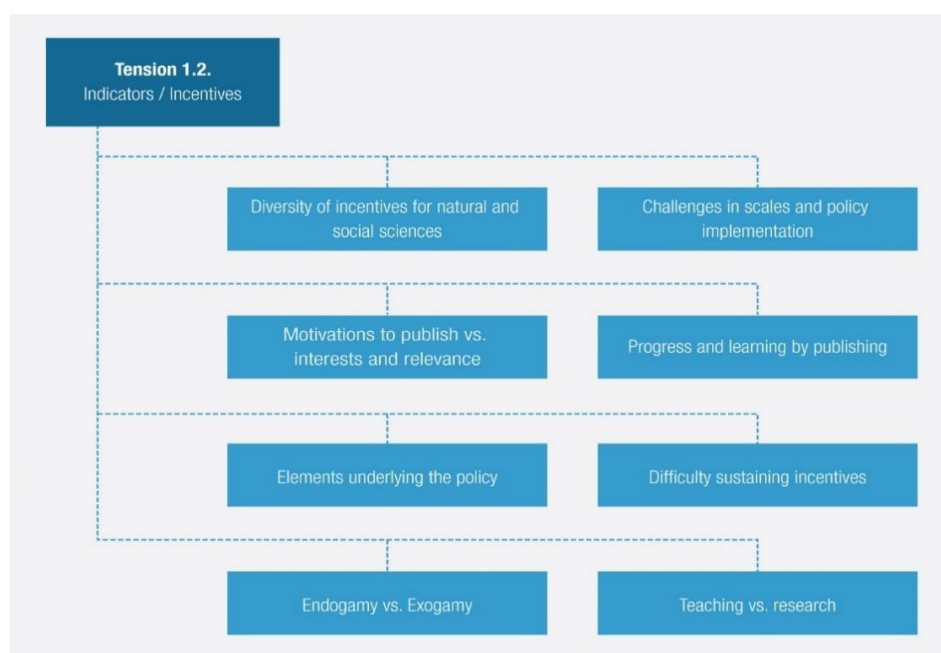
As Boni & Velasco (2019), Research in Medical Science mentions the epistemological injustices:

The idea of Publindex seems excellent; however, I ordered the publications and those who wrote the newspaper as a scientific article and low-quality pasquín. Moreover, there is another serious problem with Publindex. It judges all journals of all disciplines with very similar criteria, which should not be the case. A journal of a medical specialty, for example, has a different purpose to a social science journal or jurisprudence, or theology.

## Tension 1.2 Indicators as a starting point for incentive design scientific production (PRUS).

The actor's remark on diversity Incentives for natural and social science includes local relevance and balance teaching vs. research (Figure 23). The interviewees, in general, consider rethinking the scientific production indicator as an incentive in terms of inclusion and modernization.

Figure 23. Scientific Incentives (PRUS)



Source: Created by the author, based on semi-structured interviews.

The Secretary of the Rector mentions:

I could define it as a necessary evil, that is, in itself, any system of rewards for scientific publication generates distortions, strategies, and tactics generate rewards without necessarily signifying quality or improvement in scientific production. I believe that both methods of allocating direct salary points or unification without allocating salary points could be loosely described as methods. Both have advantages and aspects that must be corrected, as Welpé et al. (2015) mentions in terms of Incentives and Performance Governance of Research Organizations.



### Research Manager Art:

On the validation mechanism of the works, we were able to accept that the artistic fields have their validation circuits. We needed to use that as a utilization plant instead. Established circular spaces that have a mechanism to evaluate other kinds of outputs as conservation and curation festivals.

### Research in Social Science and Humanities:

Should academic research incentives. I do not think people have to pay more for what they do: people who do science because they do science. They should not pay more or less for doing good or bad science. The scientific community should review and discuss the relevance of people's work, which should not be monetizable because what is done is the prostitution of papers.

### Research in Medical Science:

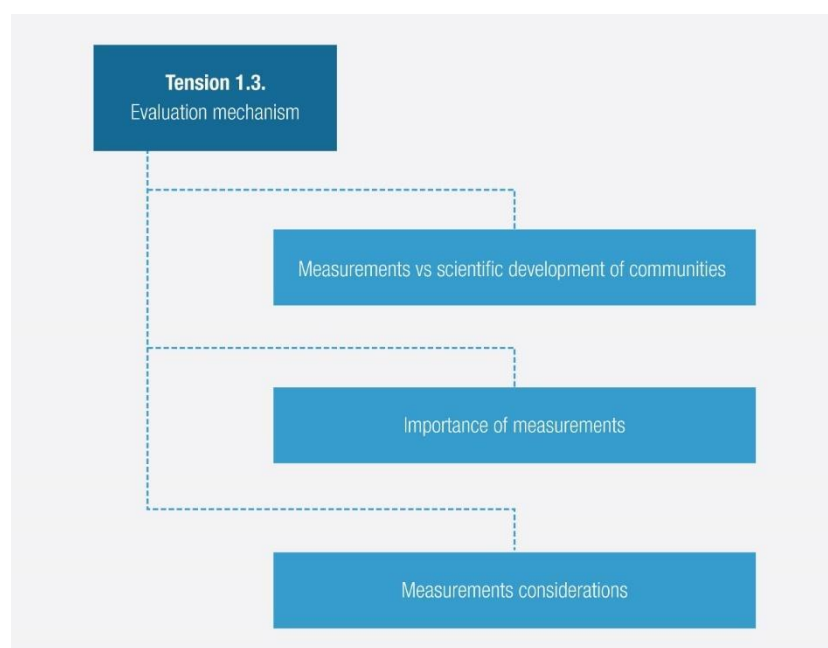
Ah, there's Boehringer, Roche, and Bayer; so for me, it is straightforward to get micro incentives, such as guaranteeing the presentation of that work in a congress with a pharmaceutical laboratory. However, if the investigation were about entomology, let's say how the moth reproduces. Sadly, this generates little interest.

Research in Business Management: "The universities for x or y reason have wanted to point to the issue of the qualification of people. The production and activity in general research mean hiring doctors or financing the doctors' information and then obviously paying them accordingly." As in the literature, Binswanger (2015, p. 19) expresses several perverse incentives are associated with the competition for publication.

### Tension 1.3. Evaluation Mechanism PRUS

For the actors in the PRUS, measurement consideration is essential to develop the scientific community. Interviewees recognize the indicators are changing the organization's structure and culture. Perhaps, some of them describe the evaluation mechanism's problem related to changes in the organization's structure and the actors' behaviour (Figure 24). The recommendation is to preserve the learning process in the organization and its integrity.

Figure 24. Evaluation mechanism and the manipulation of indicators (PRUS)



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

The Director: “We are talking about great volumes of information, of an expanded number of scientific communities, but I do not believe that it is a phenomenon exclusively marked by the peer review system.” On the other hand, the Director of University Press comments: “A central preoccupation on the part of government organs of the universities of the indicators of investigation, that also causes publishing house changes.”

Researchers in Philosophy: “The type of publications, there are significantly fewer publications in philosophy and humanities that reach the indexes or the impact factors that other types of Journals do.”

### Research in Business Management:

“The citing clubs are the *compadraje*<sup>27</sup> (you cite me, and I cite you), the abuse is given, the self-citation, the subject of the contracts in terms of what can and cannot be cited. So, I think that not only in Colombia is it failing to preserve the "integrity" of some indicators that some aspects may be essential, but structurally they are not to assess the relevance.

### Research in Natural Science:

In *Frontiers*, for example, one of the valuable things it has is the number of times the article is cited and the number of times the article is downloaded. Of course, the number of times the community considers the article. Therefore, there is a lot of work to do to evaluate the articles and not the Journals.

## Tension 2. Index-Journal effects

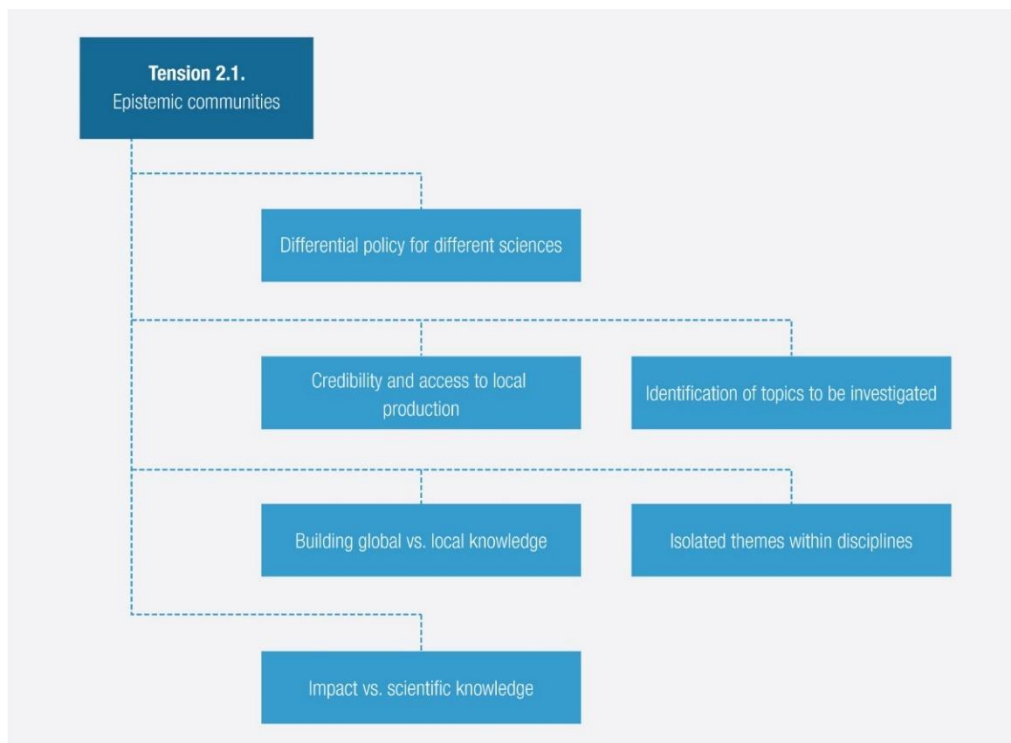
### Tension 2.1. Epistemic communities (PRUS)

From the PRUS, the main issues in the epistemic communities' tension are the credibility and accessibility of the local knowledge production, the friction to building local vs. global knowledge, and social science struggling with isolated themes within disciplines (Figure 25). The researcher insists on the asymmetries in the terms conditions that are doing science in Colombia, the lack of representation of each mode of product knowledge, and the recognition of different disciplines as Medvecky explains epistemic justice (2018, p. 1395).

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<sup>27</sup> *Compadraje* Spanish term meaning union or concert of several persons to praise or help each other. <https://dle.rae.es/compadraje#46kGrVK>

Figure 25. Epistemic communities (PRUS)



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

#### The Director mentions:

The current system of recognition of scientific production weakens scientific communities' construction in social and human areas. I believe that this is a recent phenomenon; it is not a long-standing phenomenon in Colombia. Thirty forty years ago, or less twenty-thirty years ago, academic communities in the social sciences and humanities were tremendously strong and not about the current knowledge production circuits. Still, I am referring to lawyers, historians, philosophers, and social scientists. On the term cognitive injustice, Boaventura de Sousa Santos (2010)

Director University Press: "Reflections on the perspective and the relevance of doing science in the country, let's say -local science versus an intellectual Taliban- that they enact an excellent connection between what is produced and a thousand ways of making knowledge visible in a technical way." Alternatively, research in Social Science and Humanities:

I would like to insist that the problem is not one of the Social Sciences. The problem is the terms and conditions in which knowledge is produced in Colombia, guided by the business interests of the large publishing houses, which is a problem for all the Sciences, and not solely a problem for the Social Sciences.

### Tension of 2.2. Autonomy in the research agenda, -PRUS-

The interviewees' remark of Identifying research agendas where the relationship visibility vs. relevance interest is a challenge for knowledge management regulation (Figure 26). The interviewees recognize some areas of knowledge as art have another communication channel; researchers in science recognize some topics are more citable or attractive than others.

Figure 26. Research agenda autonomy -PRUS-



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

Research Vice-Rector Manager Art and Creativity: “When you speak of arts. For example, Musicology is also very good in the middle if there are enough journals, but musicians are not interested in publishing in journals”. Similarly, a researcher in Medical Science:

I believe that there is discrimination towards our studies. I always insist that a work of a publication, an article has to have a so what? What do you get out of here? So if so, what? This disease is costly in California, how interesting, but if you say this disease is costly in Colombia, then people say: and what? Then it must have been like something else.

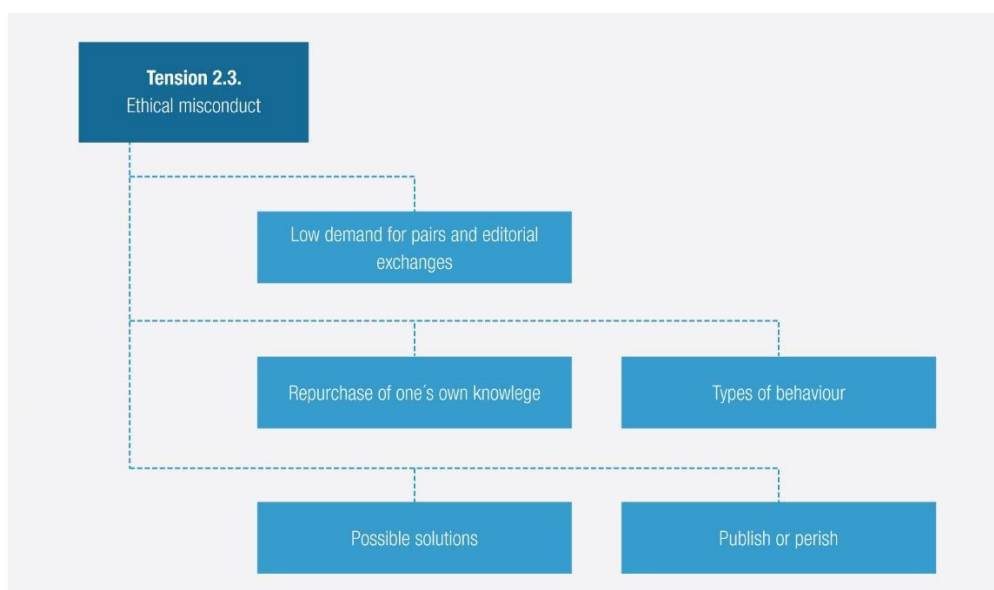
Researcher in Natural Science: “In my area of immunology, it is very evident that you may want to publish something of very high quality.” Researcher in Science:

If it is a subject that has to do with human cancer research, that will be the bone. Publications and indexes are going to favour that type of research. However, if you dedicate yourself to studying certain animals or plants, you have no commercial interest. Therefore, the field of the output of these publications is going to be smaller.

### Tension 2.3 Ethical misconduct (PRUS)

In the interviewees' narratives, the problem of publishing or perishing was identified as being related to low demand for pairs and editorial exchanges who affect in two ways the first repurchase of one's knowledge and the types of behaviour (figure 27). The potential solutions mentioned are developed ethical principles and instruments that support research transparency and integrity.

Figure 27. Ethical misconduct (PRUS)



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

The Secretary of the Rector mentions: “I believe that we are facing terrible cancer in the production of knowledge, and we have to go to those who do not live from that, which I think exists. The passionate ones who want to contribute and don't have the publication's driver”.

Researchers in Philosophy: “Research is a subject of ethics, principles, and transparency; not only impact assessment systems.”

Social Science and Humanities: “It would be fascinating to contrast what people, professors, and academics were doing in the 80s and 90s with what is being done now. This system is designed to stop producing knowledge more and more, and I'm not even talking about critical thinking, which is already a thing of the past, so it's a very problematic situation that is not confined to science alone”.

Business Management;

In Colombia, there has been a discussion about research books and how they are valued. Minciencias and universities demands, which seems stupid because there is no guarantee to publish in Journal x. There is no evidence that this is more valuable for the scientific and local community than publishing an article. Also, you have this twin brother, publish, "trash," but publish or perish.”

Natural Science:

That is a severe problem. I'm the editor for Frontiers. At Frontiers, they have a number as the primary incentive. I, as the editor, choose to pay or not to pay. They named me editor, and they started sending emails to everyone to send and submit articles for publication. Then with the Good Will and the value that the Latin American community of immunologists represents, many people decided to submit trivial publications.

To summarize this case, PRUS presents governance-based on seeking a balance between national and international pressures. The installed capacities of scientific journals have historically played a relevant role as leaders and pioneers of international indexing.

Likewise, the institution has been working to build incentives with teaching, research, and extension that allow the institution to advance. However, there is friction between basic and social sciences knowledge and between managers, researchers, and editors. The latter is still not represented in the international metric indicators, which has led the actors to denote friction between international incentives for scientific production and autonomy in research development.

### 6.2.2. Private University Excellence Mission (PRUE)

The following section explains the governance, institutional logic, and the actors who respond to the tensions in the PRUE institution's case (See Annex 11).

#### 6.2.2.1. Governance (PRUE)

This institution's governance has been mainly centralized, focused on incentives for excellence and internationalization through incentives and bonuses. The journals that have been prioritized are few, which have allowed centralizing resources to keep them indexed at the highest levels of indexing.

Concerning scientific production, the goal of the organization is the production of high quality and excellence. Thus, most professors publish in international arenas, top international journals representing WoS and Scopus; the institutions decrease scientific journals. Therefore, they decided to maintain the most strategic journal in terms of being leaders in specific academic communities:

In its history, the University has consistently recognized any research/creation topic as pertinent. Research/creation (generation of knowledge) cannot be limited to or favour one topic over another, and therefore the discussion of relevance should not be relevant in the university. The university's objective is to foster the generation of new knowledge and its dissemination with quality standards. (Universidad, 2015)

This institution was one of the first to start indexing journals in Publindex. By 2001, it had eleven journals indexed in Publindex. However, a change in the internal policy in



2002 left only three journals indexed in Publindex, after which the number of indexed journals has been progressively increased. The policy shift change was to prioritize publication in international journals rather than having institutional journals.

This institution has had a policy of incentives or bonuses for articles published in international journals. The faculty of social sciences has a strong editorial team, which has allowed its institutional journals to have international prestige and indexing in the WoS and Scopus databases; the interview with its editor shows the committee's editorial quality criteria. Few other faculties have institutional journals. Some have given a twist to the publication with an outreach character as a popularization of science.

#### *6.2.2.2. Institutional logics (PRUE)*

All institution members have a standard narrative concerning high-quality indicators and excellence in international environments in institutional logic. One of the critical points is to find balances in terms of incentives by areas of knowledge so that they are equitable among faculties. Other problems are the cost-benefit between publishing and other forms of production such as consultancies or projects. These cases are presented in areas such as Engineering and Business Management.

Every school defines regulation in terms of scientific production with the primary goal of excellence and quality. Thus, the incentive is to publish in different communication channels or scientific journals relevant to the academic community. These incentives are reevaluated according to the trends. According to the final regulation of the institution (Universidad, 2019), the indicator to evaluate research are:

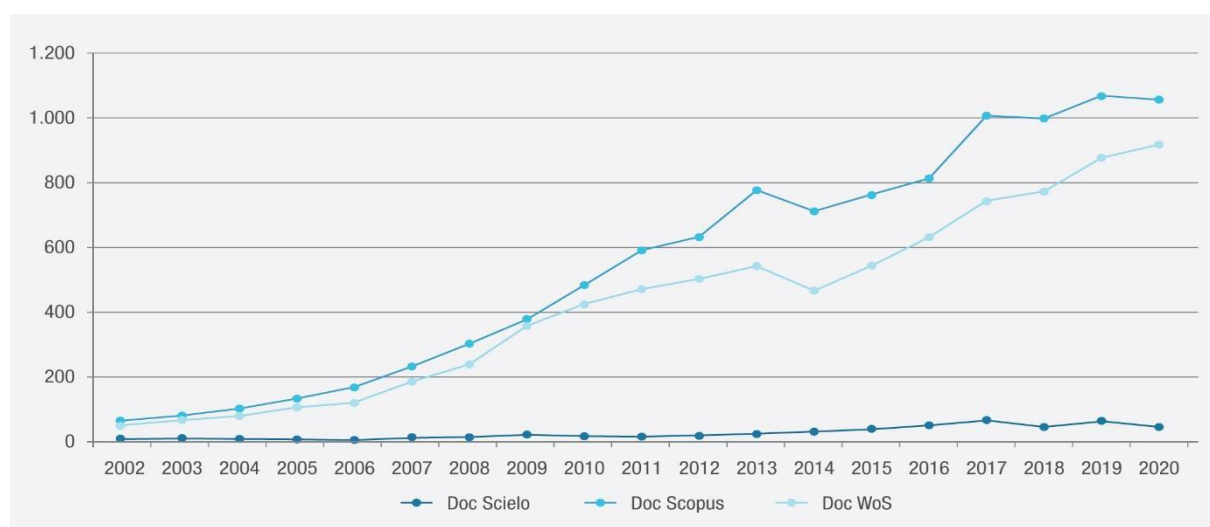
1. Quality products with international standards,
2. Pairs and referees according to the discipline, be it national or international, using qualitative and quantitative assessments,
3. Transparency to engage the community,

4. Dynamic and adaptive assessment, using inclusive metrics according to the evolution in the research area of knowledge,
5. Congruence with the mission of the institution,
6. Simplicity.

Adjust the research measurement system under international standards. The products recognized in PRUE are articles in Scopus Q4 to Q1, proceedings in Scopus Q4 – Q1, Books category D to A, creation product category D to A, transference product D to A. According to the university's institutional development plan, 2016- 2020, the university's goals may improve the scientific production quality in alignment with international standards—objective 1.5.1.

Concerning the historical, scientific production of 10 schools that includes some research centers, the evidence demonstrates that most products are Q5 categories created for the university to denominate articles published in the national system Publindex or journals indexed WoS and Scopus. The research Vice-rector recommends improving the output only with the journal index in international databases. For that transition, the requirement is a new normalization to internal funding. The amount of research funding per academic unit depends on the quantity of scientific production with international quality.

Figure 28. Productivity in SciELO, Scopus and Wos PRUE 2002-2021



Source: Created by the author, with data from SciELO, Scopus, WoS.

### 6.2.2.3. Actors responses Private University Excellence Mission (PRUE)

Interviewed ten people, two directors, three managers, four researchers, and one editor. For this university, the priority is international excellence. Focused their policy on the highest international standards; each of the interviewees identified with the line of distinction and internationalization. Annex 9 describes the actors' composition regarding the academic level, professional background field, and citation level. This institution's actors' profiles were conducted with different areas, mainly social sciences, economics, business management, engineering, and information sciences.

The primary friction is finding the balance of bonuses and evaluation criteria by discipline and lacking local epistemic communities. Regarding each PRUE tension, the priority is to be visible in international academic or epistemic communities to establish quality academic incentives to achieve the best publication in the top scientific journal for each disciplinary area (see Table 15).

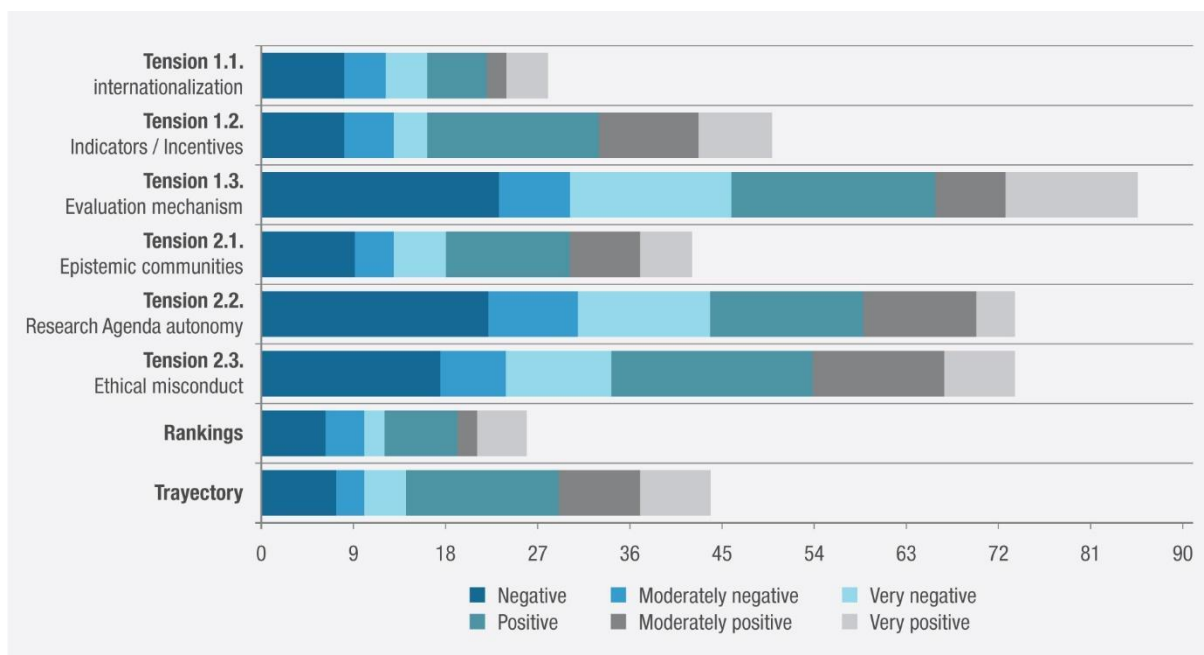
Table 15. Tensions percentage priority (PRUE)

PRIVATE UNIVERSITY EXCELLENCE MISSION - PRUE	COUNT	PERCENTAGE
<b>Tension 1.1.</b> Internationalization	7	8.86
<b>Tension 1.2.</b> Indicators / Incentives	18	22.78
<b>Tension 1.3.</b> Evaluation mechanism	10	12.66
<b>Tension 2.1.</b> Epistemic communities	8	10.13
<b>Tension 2.2.</b> Research Agenda autonomy	12	15.19
<b>Tension 2.3.</b> Ethical misconduct	20	25.32
<b>Rankings</b>	4	5.06
<b>Totals</b>	79	100

Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

Figure 29 analyses through the Atlas.ti the interview narratives concerning the tensions. The tension with more negative perceptions is epistemic communities' configuration at the local context, ethical misconduct, and evaluation mechanism.

Figure 29. Institutional logics (mainly cultural-cognitive elements) Actors PRUE

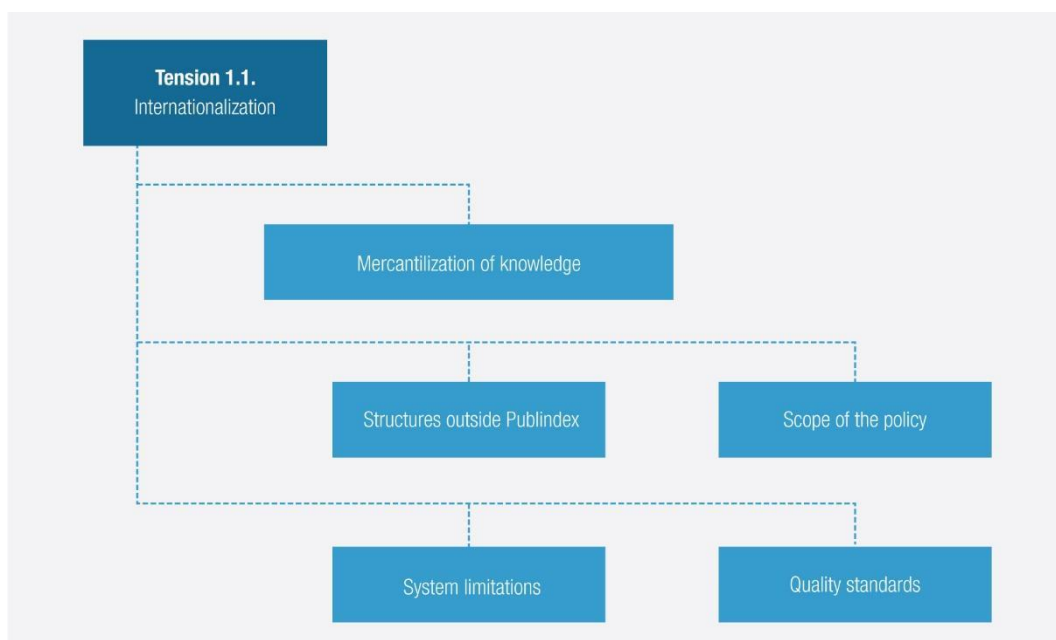


Source: Created by the author, Atlas.ti.

## Tension 1. Assessment factors

### Tension 1.1. Internationalization (PRUE)

Figure 30. Internationalization (PRUE)



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

The interviewees consider that Publindex has limitations for the university's international quality standards; for this reason, the institutional policies behaviour of knowledge production is outside the guidelines of Publindex (see figure 30).

“They no longer make the indexing career. There is no university policy, as we do not have the pressure. We do not feel the public university must have a Journal by the program. Today we have said that those in existence must be raised to the very highest of indexation. We have one in Q2 and Q3” (Research Vicerrector).

In these institutions, researchers don't trust the Publindex structure for the limitations of the policy. They believe in international quality standards to position themselves and the institution. The interviewees consider that the national model is not relevant. According to the Faculty of Engineering, the priority is visible globally:

I do not feel those local journals; the researcher tries to publish in the international journal with strong referees in the department. It comes to a local environment and needs to have publications, then begins to create second-level Journals where people begin to validate their ideas. It is excellent that I publish something of substance and quality. It is good that I have the discipline and know-how to do it and have it recognized in excellent or high-impact journals at an international level but honestly connects it with reality. (Director)

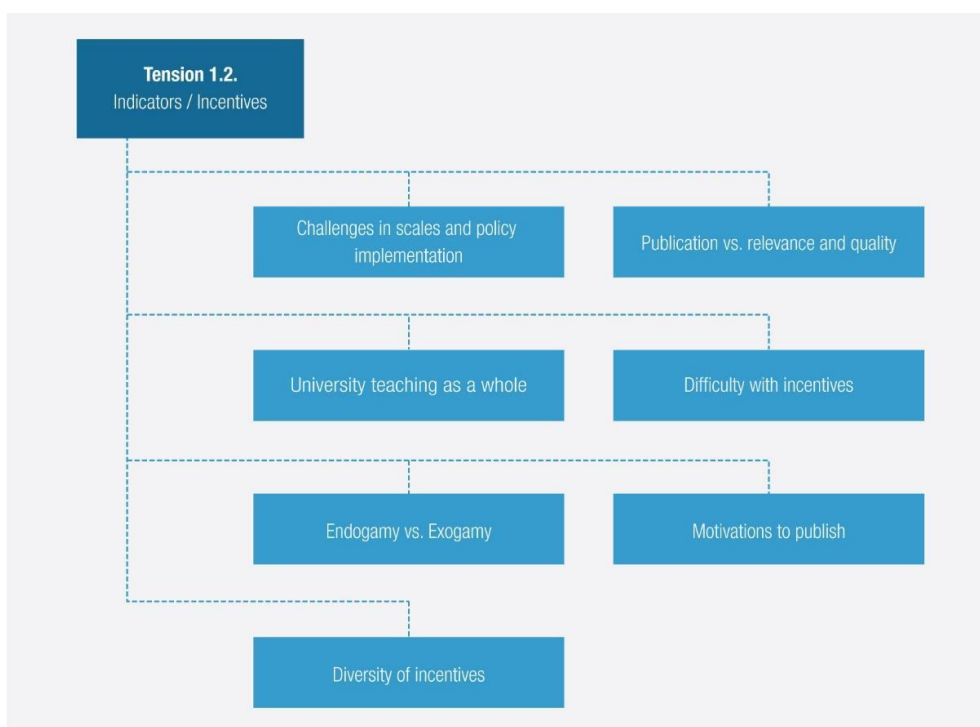
Editor in Social Science Considers:

As an institution, we want to have outstanding quality. I will not even talk about indexing, that academics consider it pertinent, consult it, and use it. I am not even talking about citing. Well, that is another topic entirely. My perspective was at the discussion level, not reviewing the entire structure's funds and the scaffolding behind the research groups' analysis, investigation research, and academic production.

## Tension 1.2. Incentives PRUE

The institutional policy implementation for the PRUE is the diversity of incentives between research, consultancy, and teaching to maintain motivation to publish (see figure 31).

Figure 31. Incentives for scientific production (PRUE)



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

Research Vicerrector (Research Vicerrector, 2017) “We only move with international standards. We don't have the problem of decree 1279, so we simply ask professors for publications articles in Scopus to regulate the entire university. Publindex is of no importance to us. In terms of the bonus, It's very variable throughout the university. The vice-rectory does not give bonuses for scientific production. Still, each unit does, and it is something we want to discuss at some point because you can have bonuses of millions of millions in Economics and Administration school and one hundred thousand Colombian pesos in Biological Sciences school”.

Research in Economics (Dean, 2017) “Good incentives, but there is a big risk. Universities were not publishing; a historical moment is valid to encourage, learn how to

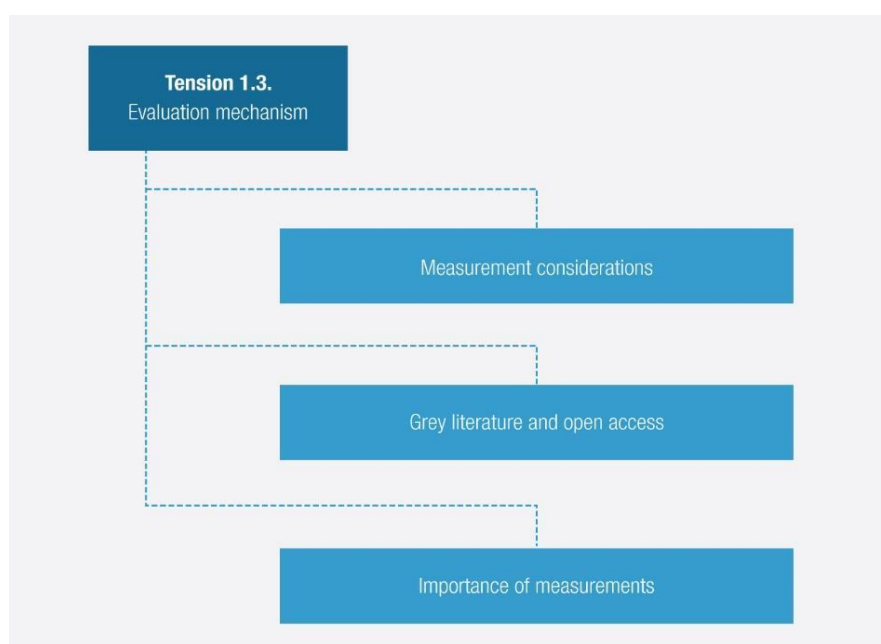
publish, implement a learning curve for universities to generate a culture of research and accreditation. There is a failure to change incentives decrees 1279, 2912, and 1444 were important, though much less so nowadays. The incentive by itself is not bad; however, failure to change, move in time, change behaviour, and avoid moral risk most certainly is”.

Editor of Social Science (Editor, Tensions scientific journal production, 2017) “There are several types of incentives; one of the incentives being that our teaching careers are included. So that is a big incentive, you have to produce to stay, but it is not the only thing. Still, you can be an excellent teacher, but if it does not produce scientific results. So our model profile professor, the regulations of the faculty of economics, clearly says: our teachers who want to go through teacher regulation have to be good in everything, teaching, research, and what we call institutional development of something being that our teaching careers are included.”

### Tension 1.3 Evaluation mechanism

For the PRUE, one of the critical points is the Importance of measurement consideration through the top excellent quality (see figure 32).

Figure 32. Evaluation mechanism and the manipulation of indicators (PRUE)



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

Director. Economic Faculty Dean:

I believe that these indicators are helpful when used in support but so that the indicators are at the service of scientific production. Still, we run a significant risk when scientific production is put at the service of these indicators and these metrics. We need metrics. Let's just agree on them as a scientific community. We have to agree on the metrics within the disciplines and the interdisciplinary and find a useful tool to be better researchers.

Researcher in Physics:

I know of people who have won the Nobel Prize in physics, who have abysmal scientific production. Suddenly, out of nowhere, they have a publication that changes their career, so I think the number has nothing to do with the impact. For example, I publish in Q1 Journals, and I am tempted to publish in Q2 and Q3. But I prefer not to publish in Q2 and Q3 Journals to maintain the same level of continuously publishing in Q1. My policy is not to have many articles but to produce outstanding papers. The H index is very much in my favour; nevertheless, I try not to let myself be carried away by publishing or perish.

Editor Social Science: “The Journal could go out with everything international, completely, but why doesn't it? Because we think that we want to give it space so that our products can also be used even by other academics in this community.”

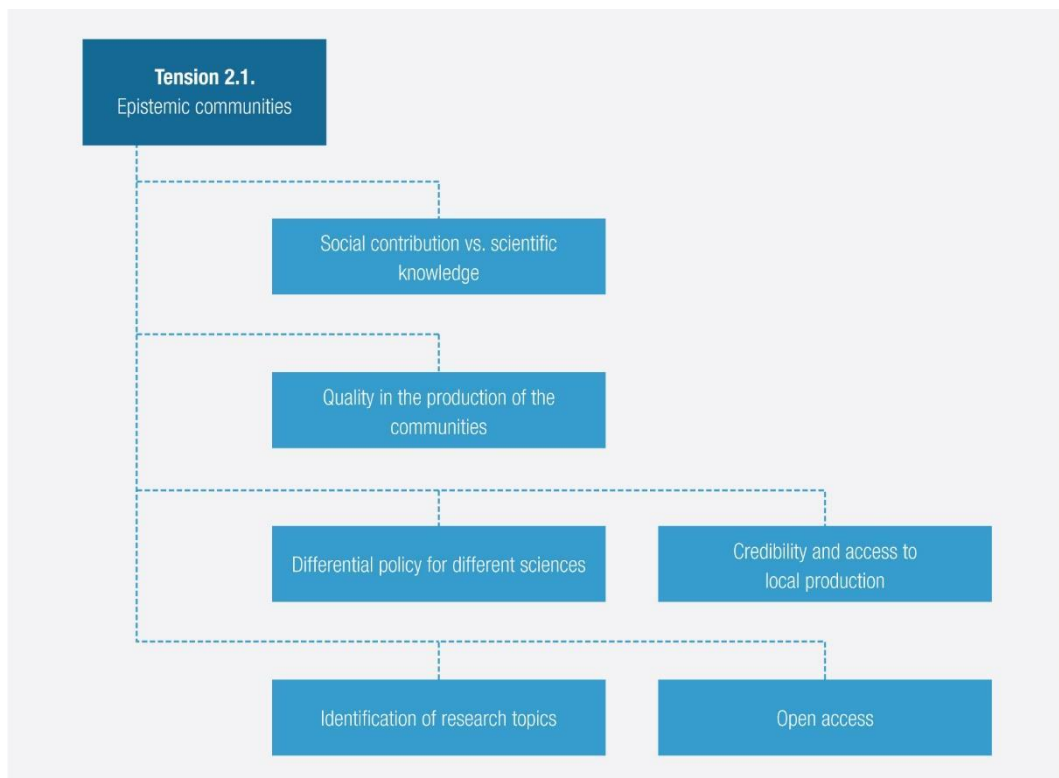
## **Tension 2. Index-Journal effects**

### **Tension 2.1 Epistemic communities (PRUE)**

For this institution, the priority is quality in the scientific production of the communities. For that reason, they are working on a differential policy for different sciences at the managerial level to achieve credibility per discipline (see figure 33).



Figure 33. Epistemic communities (PRUE)



Source: Created by the author, based on semi-structured interviews.

#### As Research Vicerrector:

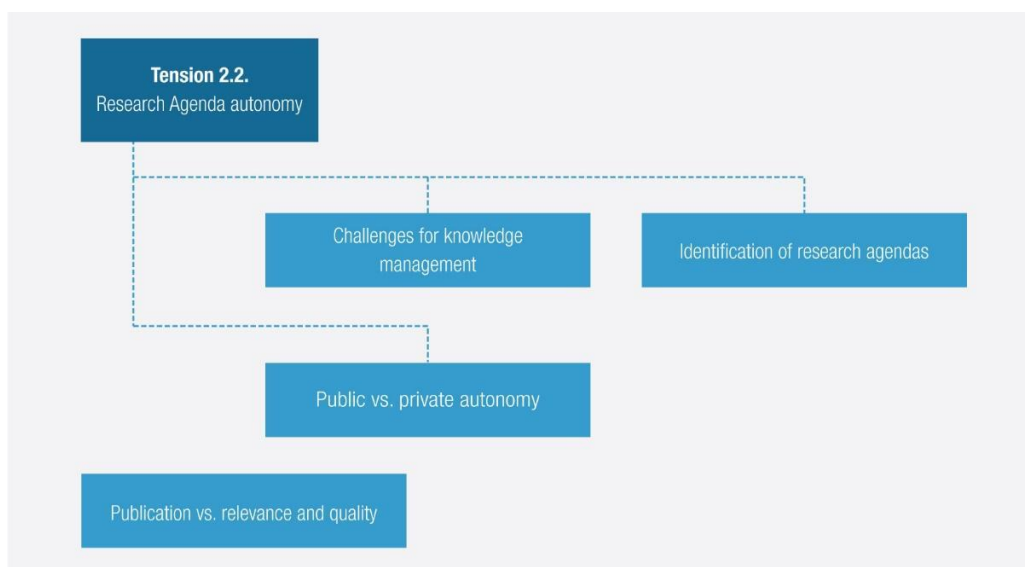
It depends on the area. In some areas, they are hired without publications, which I learned as vice-rector. Still, even in economics, they start publishing after six months or one year after graduating, they hire people with a lot of exposure, but they do not have a publication yet.

If we look more at what is happening outside, we could quickly lose sight of what is happening inside our institutions, or worse, within the Colombian community. Thinking about what is happening with our local knowledge and indexing them, we must be conscious that we are not developing ourselves. Yes, this can indeed happen, or rather, we are not fuelling the discussion of these evaluation and indexing systems and those kinds of things here. We believe that our research has a direct impact on what we do as economists. (Director, Economic Faculty Dean).

## Tension 2.2. Autonomy in the research agenda (PRUE)

The respondents consider it a challenge for knowledge management to identify research agendas with relevance and quality. The other tensions in the relationship are public and private autonomy (see Figure 34).

Figure 34. Research agenda autonomy (PRUE)



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

For the research Vicerrector:

It may mean both or not because local relevance is sometimes not published at the international level. We achieve a lot objectively with citation, but it has another impact if we know that constitutional court documents must be published. The teacher has to be recognized for that work, then we make that equivalent, and we tell Social Sciences we give them ten journals that are not in Scopus or WoS but that you think are relevant, cause impact, and as such we make equivalences with Q3 or Q4. I wouldn't say I like relevance; all research is relevant, from the fundamental research to the one that wants to solve a community problem. For me, everything is relevant, and the vice-rectory has always seen it that way. What I do today has a more local impact.

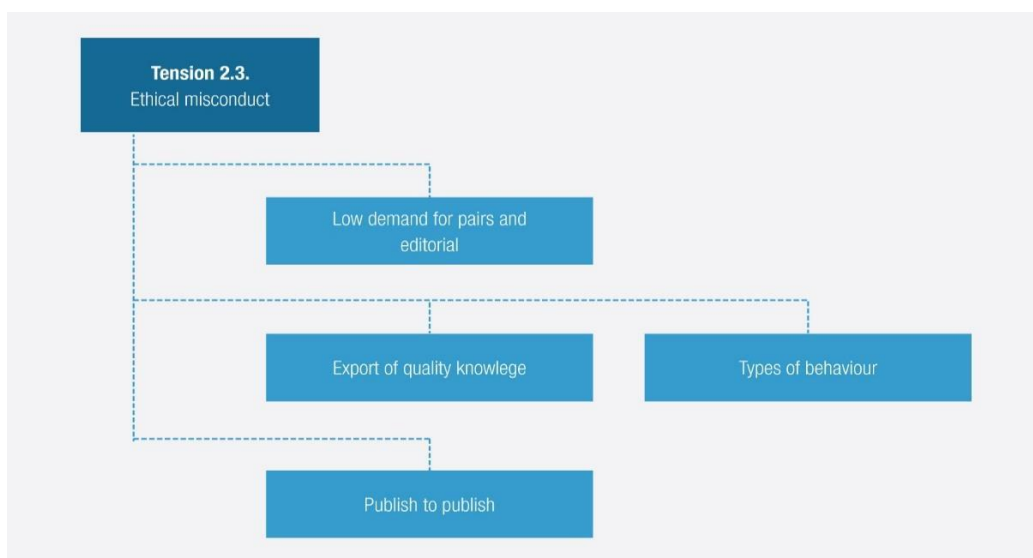
Economic Faculty Dean:

In general, it is a problem we have to face, and I am aware that we have to face it. However, it is less severe in economics because much of the universal knowledge of economics problems are fed and nourishes local and regional problems. What I'm trying to say is, the cutting-edge research on monetary policy issues that are taking place in the top economic Journal has very great relevance to monetary policy and tax reform here in Colombia. I'm simply giving an example.

### Tension 2.3 Ethical misconduct, -PRUE-

From an ethical perspective, as an institution that follows high standards of quality and excellence, ethical criteria are a fundamental and intrinsic part of the scientific production process. Therefore, the behavior is according to international standards (see Figure 35).

Figure 35. Ethical misconduct (PRUE)



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

### Director Library:

We, as a library, are our reason for being. We try to have a basic formation in respecting, inciting, and access to information. The purpose of the university is publishing to export quality of knowledge to define the types of behaviour. The rest of the subjects are already complicated; we are in a capitalist world. All those situations are seen daily; for example, the university's library system has 120 academic databases subscribed to in different areas of knowledge.

Research in Economics: “What is the moral, political and editorial risk? Measuring well in exposed communities is the problem of behaviour—the transition from needed in full-cycle research. Generate a model of academic careers by behaviour and discipline”. Editor of Social Science: “At the university, have a plagiarism detection tool. We get it from the same evaluator’s concepts like—I saw a good piece of the article published. All these Journals and elsewhere, and that is an academic sanction I think it is also an issue of, look this is not so this does not work so.

To summarize, PRUE presents governance based on a mission of excellence and internationalization. The coherence of the narrative among all the institution actors, managers, researchers, and editors is related to the search for high international quality in its scientific production. Faculties have unbalanced incentives. There are faculties with more significant incentives for scientific articles than others. The institutional logic has been regulated in recent years. In search of an equitable scientific evaluation model, it responds to the high-quality criteria by discipline. Some interviewees recognize that the vacuum of building incentives with international standards leads to little recognition of scientific production carried out in local environments.

### 6.2.3. Public University Heritage mission (PUH)

The following section explains the governance, institutional logic, and the actors who respond to the tensions in the PUH institution's case (Annex 12. Public university heritage mission (PUH)).

#### 6.2.3.1. Governance (PUH)

This institution has had decentralized governance. Several projects have coexisted organically, without much internal coordination, such as the Open Journal System -OJS- project, the SciELO Colombia marking program, and the exponential scientific growth journals indexed in the national Publindex system. It is one of the institutions with the most significant number of scientific journal editors, indexed in the national Publindex system.

In this university, scientific journals by faculties, institutes, and research centers have grown decentralized. In 1996, when the Publindex call began, it was the first university to index the most significant number of journals, nine (9), and its indexing process has been exponential. By the year 2015, it had 60 journals indexed in Publindex. Among the processes that have been developed in a centralized manner was the development of the Open Journal System -OJS- software, linked to the institutional repository, which has allowed for standardized data and visibility in the indexing and ranking systems. In another way, this institution has been leading the SciELO Colombia program, providing training and offering the journal marking service for all institutions in the country, with some critical and constrain from the Colombian editorial community related to the transparency of the marking process and rates.

In terms of the scientific articles from (PUH) published in Web of Science, there are around 7500. These institutions are top in Web metrics ranking because the repository per volume is the biggest in Colombia. The Research and Extension Vice-Chancellor's Office mentions the mission is

To guide and manage policies, guidelines, and strategies for promoting, developing, and consolidating research and extension of the National University of Colombia. Through plans, programs, and projects with criteria of integration, equity, excellence, and quality that respond to diverse international trends, national and regional needs, and interests and the respective academy of the university community of the different headquarters.

#### 6.2.3.2. *Institutional logics (PUH)*

The regulations of salary and pension system for teachers at state universities has a close relationship with scientific production as an incentive described in the following regulation (i) Decree 910 de 1992 (ii) decree 1444 September 1992, (iii) decree 1742 August 3, 1994, (iv) decree 2912 December 31, 2001, and (v) decree 1279 June 19 de 2002. But, first, in terms of the genesis of the regulation Decree 910, 1992:

It was a salary system characterized by austerity in setting the basic salary versus generosity in valuing the "productivity of university work" with the intention, probably, of

pressuring the teacher so that his work would go beyond his participation in the classroom. Suffice it to say that the "hooking" salary for a professional who recently graduated with ten semesters of a duration of his academic program and was placed in the category of "assistant instructor" to start his teaching career was 126.5 points, points that would be equivalent to a monthly salary equal to \$1,320,407 in 2013 when the value of the point amounted to \$10,438. The linking salary in 2013 for that same professional reached \$2,244,170, with the salary regime currently in force. (Tobón et al., 2014, p. 25)

Decree 1444, concerning Decree 910, not only tightens the conditions for awarding points for academic productivity of professors but also specifies the requirements for its award; It retains the same items contemplated in Decree 910 for the productivity salary category (a category that is supposed to be the one that gives the possibility of increasing the salary without limit) with the clarification of setting a ceiling for the points received in cases of thesis direction and the consideration of post-doctoral studies as salary points" (Tobón et al., 2014, p. 27)

In 2001, Decree 2912 of December 31 of that year repealed Decree 1444 of 1992 to introduce profound modifications to professors' salary and benefits system at official universities in Colombia. The new decree indicates that the modification of the salary of professors with an indefinite term employment relationship may only be made for three concepts: Degrees corresponding to undergraduate or postgraduate university studies. On the other hand, the salary variation does undergo major transformations regarding the factors of academic productivity and periodic recognition of teaching work, since the former ceases to be a salary factor and becomes a bonus, not constituting a salary, paid only once. The latter is replaced by two annual points for seniority for all professors plus other points recognized in regular competition in each university to evaluate the outstanding performance of the top third of the different categories of the teaching scale. (Tobón et al. 2014, p. 32)

Decree 2912 disaggregates the score into several compartments according to the visibility or circulation coverage of the media in which the professor's work appears. To fulfil the purpose of visibility, the bonus was conditioned to the articles appearing in journals that had been previously accepted in certain indexes of publications of recognized international prestige or that, at least, had been indexed or approved by Minciencias (Minciencias). For example, the bonus points were assigned as follows in traditional, complete, and autonomous articles in systematics (the so-called "full paper"). (Tobón et al., 2014, p. 32). (See Table 16)

Table 16. Bonus Points. Publication in Journals. Decree 2912 of 2001

PRODUCTION TYPE	JOURNAL CLASSE	POINTS
For works, essays and articles of a scientific, technical, artistic, humanistic or pedagogical nature, published in Current Contents journals or internationally indexed journals.	Type A	240
	Type B	192
	Type C	128
For work, essays and articles of a scientific, technical, artistic, humanistic or pedagogical nature published in international journals or journals of international circulation indexed and approved by Colciencias.	Type A	128
	Type B	80
For works, essays and articles of a scientific, technical, artistic, humanistic or pedagogical nature published in national journals of national or regional circulation indexed or approved by Colciencias.	Type A	80
	Type B	48

Source: (Tobón B., Rhenals M, Agudelo V, Pérez P, & Correa, 2014, pág. 33).

Decree 1279, 2002 establishes the salary and benefit system of the teachers in Public Universities. In terms of scientific production, the current legislation (incentives regulation with nineteen years) establishes, “Teachers who enter or re-enter the teaching career are assigned the salary of academic productivity following the different academic modalities, their criteria, and their various ceilings.” Thus, scientific production is the direct incentive to promote and increase the salary. For that reason, it is one of the top productivity institutions; perhaps, in the last couple of years, employee salary levels have been one of the main problems in terms of organizational sustainability (budget). Decree 1279 has created the internal logic of incentives for scientific production in publishing articles or creating institutional journals in terms of institutional logic. See in Table 17 a comparative analysis between decree 1444 and decree 1279.

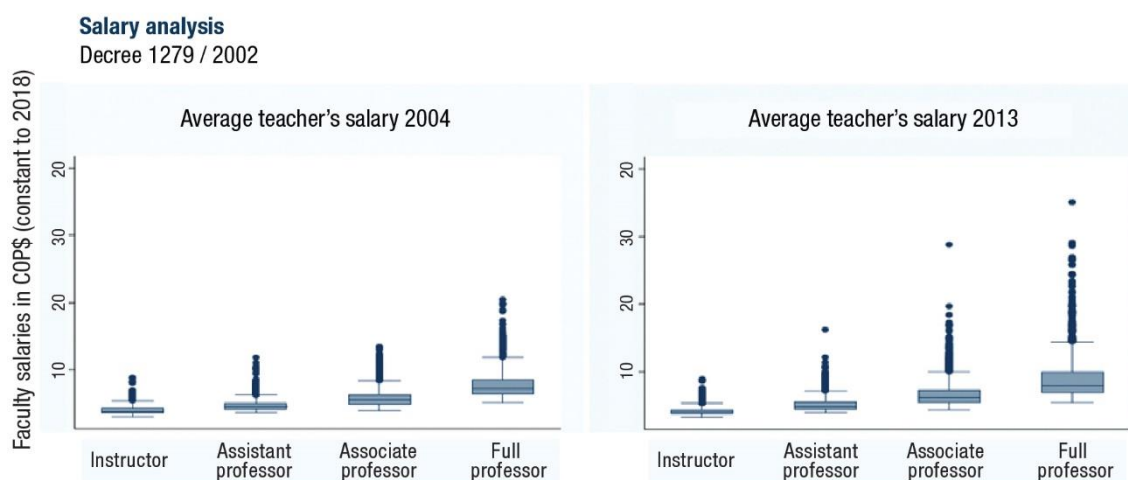
One of the main discussions is the disparities in teachers' salaries in public universities where the starting salary is meager. The relationship of incentives with the three mission activities of teaching and research are very distant, in which scientific production is prioritized above the others to increase the salary, the risk of which has been the exaggerated increase of a strange elite group in terms of unexplained points, leading to very high salary increases. Therefore, the reform of decree 1279 of 2002, the salary and state regime for state teachers, is critical in the public university system within the Ministry of Education (see figure 36); by 2021, the highest salary in a public university is around 61'000.000 Colombian pesos which is equivalent to 13.000 Euros per month.

Table 17. Comparative decree 1444 vs. 1279. The point from Scientific production

TYPE OF ACADEMIC OUTPUT	DECREE 1444	TYPE OF JOURNAL	DECREE 1279		
	Requirements and points		Full paper	Short Communication	Editorial and others
Papers, essays and articles of a scientific, technical, artistic, humanistic or pedagogical nature.	Up to 15, in specialized international journals abroad or through video programs, film or phonographic productions abroad with international distribution.	A1	15	9.0	4.5
	Up to 8, in national specialized magazines of international level or through video programs, national cinematographic or phonographic productions of international diffusion.	A2	12	7.2	3.6
	Up to 5, in specialized national magazines of national or regional circulation or through national programs, videos, film or phonographic productions of national or regional circulation.	B	8	4.8	2.4

Source: (Tobón B., Rhenals M, Agudelo V, Pérez P, & Correa, 2014).

Figure 36. Public Universities Salary Analysis reform decree 1279, 2002.



Reference: MEN's (Ministry of Education) calculations. General Study of Public Universities salaries (Universidad de Antioquia)

Source: (Tobón B., Rhenals M, Agudelo V, Pérez P, & Correa, 2014)

### 6.2.3.3 Actors respond to the public University Cultural Heritage Mission (PUH).

In (PUH), 15 interviews were conducted with two directors, four managers, seven researchers, and two editors. Annex 10 describes the actors' composition regarding the academic level, professional background field, and citation level. According to table 18, the



tension remark was ethical misconduct concerning the pressure to publish or perish. Related to the opposing narratives of the interviewer are the incentives and ethical misconduct (see figure 37).

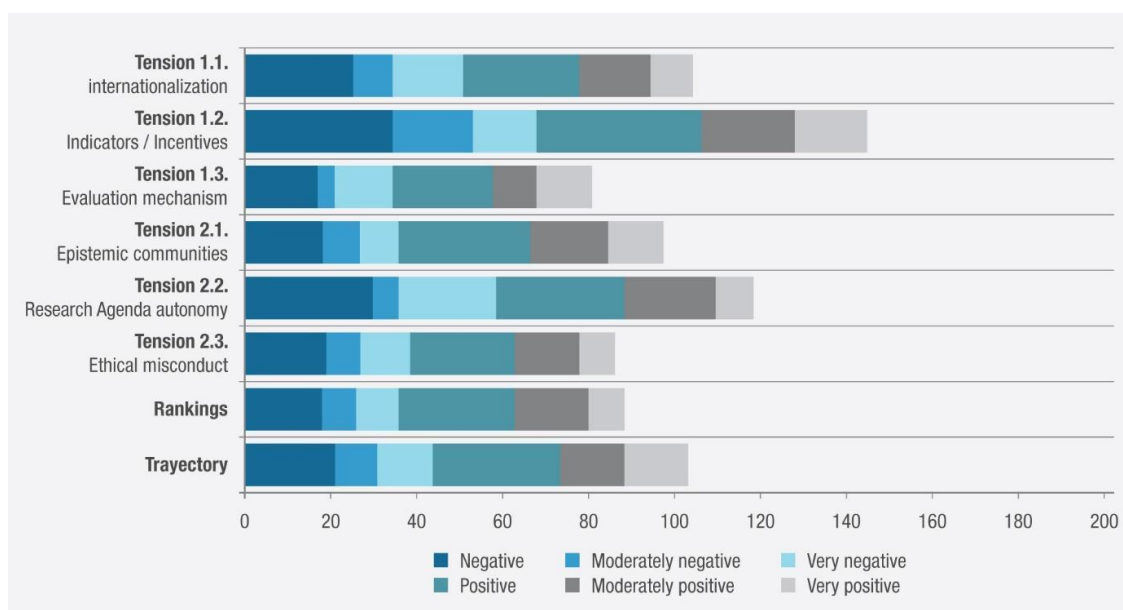
Table 18. Tension Scientific production (PUH)

PUBLIC UNIVERSITY HERITAGE MISSION - PUH	COUNT	PERCENTAGE
<b>Tension 1.1.</b> Internationalization	16	14.29
<b>Tension 1.2.</b> Indicators / Incentives	16	14.29
<b>Tension 1.3.</b> Evaluation mechanism	23	20.54
<b>Tension 2.1.</b> Epistemic communities	7	6.25
<b>Tension 2.2.</b> Research Agenda autonomy	16	14.29
<b>Tension 2.3.</b> Ethical misconduct	21	18.75
<b>Rankings</b>	13	11.61
<b>Totals</b>	112	100

Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

The most negative tension is the relationship with the indicator of scientific output as a salary incentive, see figure 37.

Figure 37. Institutional logics (mainly cultural-cognitive elements) PRUE



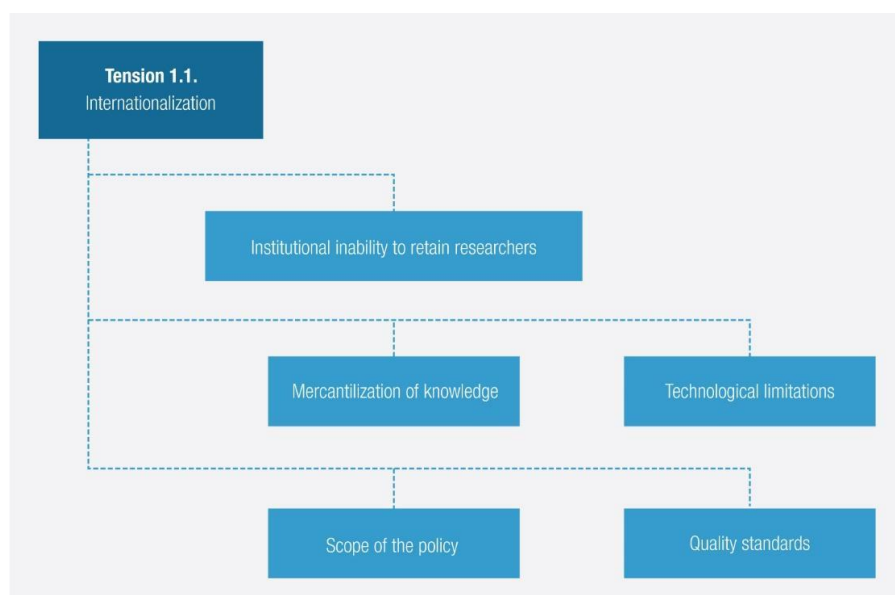
Source: Created by the author, Atlas.ti.

## Tension 1. Assessment factors. Internationalization, Incentives and Evaluation Mechanism

### Tension 1.1. Internationalization

The interviewees consider the national policies have marketed the knowledge, which generates an institutional inability to retain researchers (see Figure 38).

Figure 38. Internationalization (PUH)



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

Academic Vicerrector: “Minciencias recognize the value of national journals. To know that we protect at the national level, as that logic of production from the very local to the very international.” Researcher Electrical Engineering: “There are more Basic Sciences journals than Human Sciences or Arts. I also think that there are areas where their tasks allow a greater number of publications to come out, for example, in areas such as physics or chemistry.”

Incentives Office: “I think they are good elements that generate another state. Where is a policy Publindex? We return to the Publindex Policy objective. Suppose you are aware of the national impact journals. In that case, it is a more political issue.”

Research in Pharmaceutical: “Publindex as a stimulation and recognition system is an erroneous model. All the knowledge generated in Colombia was going inappropriate, and the discourse has not changed, that knowledge takes us to another economic and social status.”

Editor in Social Science Faculty (Editor, Tensions scientific journal production, 2017) “The system has the possibility of becoming a great system of circulation of knowledge; the potentialities in the country exist; the work capacity of our researchers is enormous in all areas. There is not enough critical mass of qualified researchers in all the fields; worst of all, the system cannot retain great investigators”.

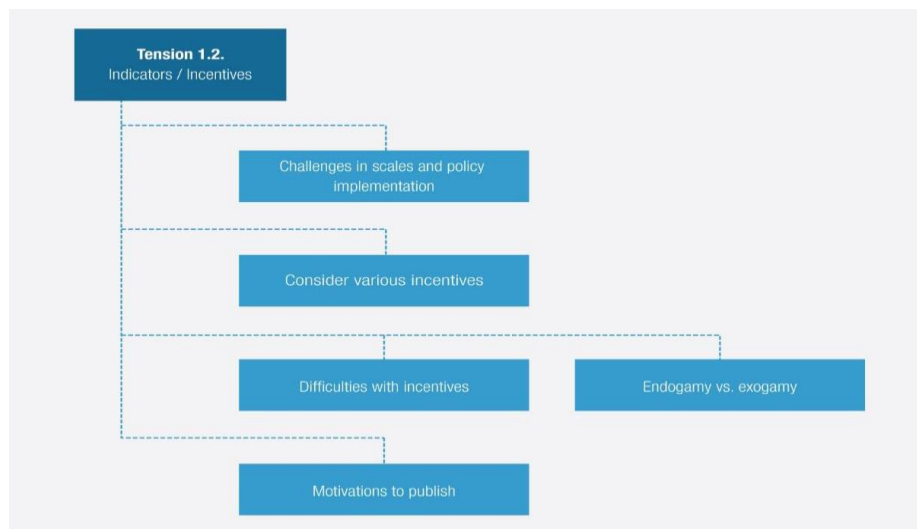
Editor Biotechnology:

So I believe that Publindex interestingly has a positive role in the administration system. I understand that Minciencias does not try to generate a subsystem rigged to protect the Colombian author, some suggest. I think that Publindex tried to generate a publishing culture with rigor, and it has undoubtedly succeeded. That Publindex has problems today, most certainly. They got into something very complicated and tried to evaluate university academic publishers with quality standards by the results and not the process. It is incomplete because the academic publisher, as literature has shown, is a specialized publisher. In addition to being evaluated by reproduction processes, the impact of knowledge has to be evaluated. So the fact that it has a quality system does not mean that the publisher is good.

### Tension 1.2. Incentives (PUH)

According to the interviewers, the main challenge is the scale of implementation in various incentives to define the motivation to publish. It is considering the balance between endogamy and exogamy requirements (see Figure 39).

Figure 39. Incentives (PUH)



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

### Research Electrical Engineering:

My view concerning this point is that it was necessary at one point. I am no longer so sure that this is currently the case. We are governed by a norm that has been in place for several years, a norm that is decree 1279, which was the issue in 2002. It fulfilled a function that no longer makes sense because its objective was fulfilled when that norm was issued earlier in 1992 when decree 1444 was brought into force. This stimulus scheme, to some degree, is due to the increase in productivity. Several years ago, this scheme had already fulfilled its objective, making researchers and academics aware of publishing's importance. It was the only tool that had to generate this stimulus at that time, but it has been around. Still, it has been around for quite a long time, now we are in a different reality, a different budgetary reality, with perspectives that no longer need external stimuli.

### Incentives Office:

We are the support group for the committee's technical secretary. We help in all the operational requests by regulation exercises. Our base is decree 1279, which governs, and how the law operates here is by agreement 23 of 2008. Several professors have the same profile in the research but different points, which generates an additional income. Personally, the incentive dynamics seem to be a correct initiative. There are the minutiae of understanding, various forms in several countries. For example, the

adjustments that Minciencias is doing in journal measurement-do not share some details, but in general, I think they are very accurate with the objective. The incentive part would seem extremely necessary, in my understanding. The professor from sociology then says exciting, profound things, and his initiatives are always very friendly. A follow-up group to Decree 1279 developed agreements that clarify and extend the legislation's extent and scope. All the administrative acts have taken place around the legislation. The national phenomenon precisely, in which I understand that the university reached (72) Journals, then happened to (42) and at this moment is as in (52); is a phenomenon that has led to a pathology. The researchers prefer to publish many journals because the process is much more comfortable, getting the points to jump to the whole international process. Could one explain the national phenomenon like that? Are there people who have internationalized? or does it depend? This phenomenon is natural, but I do not know if I can explain it appropriately because it is still published outside. You know that there are partial indexing results right now in the catastrophic cuts. Some have been categorized in A1, and while others, almost half are still without a category.

#### Research in History:

I believe that those who work in Exact Sciences are more attractive than aid from the government or the universities. For the Social Sciences, it is simply hopeless from my perspective. I have done two PhDs, and each one has taken me several years. A Ph.D. can have 15 or 10 chapters, which are 15 or 10 papers. It is your work of many years. An article in Social Sciences may take one year or two to write. Publishing is also challenging. Universities demonstrate little or no eagerness to publish. One tries very hard to collect 4 or 5 articles that become a book. When you have written, it is not that you are calling with great enthusiasm to publish and disclose your findings, the job of persuasion, contacts, or friendships that one has. I do not see a great deal of enthusiasm.

#### Research in Pharmaceutical:

Publindex that is not reality, the teachers are in a very comfortable metric, have to change this, that's not fair. Also, that's why they give salary points. The Publindex curve always said that we produced everything, but when we looked at it. We related it to the impact; it was zero. It told me a very nice analysis, exciting everything, but that does not

depend on us, I said. Still, the university has autonomy, and the university can decide that it does not go to Publindex. I regret to say that it does not depend on us. We are with a regime that comes from the Ministry. I regret to tell you that Publindex does not rely on me but depends on Minciencias. It was necessary to rethink 1279, a new decree that necessarily adjusts to superior quality. For that, 1279 necessarily has the same spirit, i. e., productivity vs. remuneration. An attractive salary has professors at the public university system. At 40 years old, I quickly earn more than 3 thousand dollars; it forgives me more than 10,000 dollars in monthly remuneration.

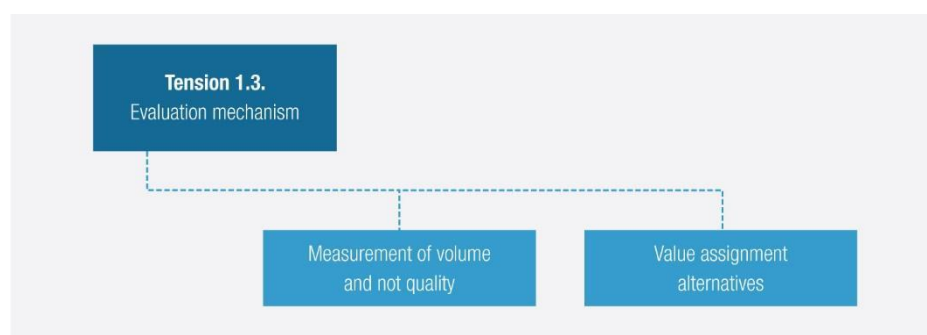
#### Editor in Biotechnology:

At the beginning of the 90's decree 1494, it appeared to promote academic development productivity, bound to economic growth, thus linking the academic product with salary stimulus. The salary stimulus does not become a bonus as in private universities but becomes a salary base. That is to say, and your permanent remuneration is already affected. Nowadays, the Colombian public system can find full-time professors earning between 4 and 5 million Colombian pesos. Even professors who are bordering today between 35 or 45 million Colombian million pesos are one, a tremendous interval. Although nominally, professors have better salaries than senators, ministers, or Colombian presidents in this country, a bone of contention, 1444 allowed the region's universities to have scoring committees.

#### Tension 1.3. Evaluation mechanism (PUH)

According to the interviewees, it is crucial to analyse value assignment alternatives to measure quality, discipline, and context (see figure 40).

Figure 40. Evaluation mechanism (PUH)



Source: Created by the author, based on semi-structured interviews.

### Research Vicerrector:

If we agree, we must think about how we change this culture. *Credibility in local production implies training for local production. It implies access and uses to local production.* These mechanisms allow us to create, strengthen from Minciencias, privilege local production, and have a strengthening look to produce. It happens to us in the universities themselves. The universities themselves do not cite. We have a department that produces knowledge, and for that, they cite outside the university itself. The doctoral professors themselves do not cite the professor who is producing next door.

### Academic Vicerrector Manager:

They measure volume but not quality. So you can't standardize the areas or measure everything in the same way. That's what these measurement models haven't understood or haven't been able to do. There are all kinds of things. Those situations belong to my peers or to the character I know that I think I have to cite. Still, there is also the grey market, and there is also the black market that I repeat, of which there are a few cases counted, but I would think that we are more between the grey and the white, right? You cite the top journal because you have to be in the top journal. And the only way to do this is that I have to see what the Dutch, the North Americans, and the British are doing. Their context is not interesting because it is not what is on the border, so I think it is fascinating to reflect on how we investigate.

### Research in History:

Rules of the game, some posterior, allow for planning with time to adjust. Those forms of measurement are processes of great contradiction, mechanisms, and methodologies of nefarious evaluation. Annoyance, the rhetoric of academic rigor, what is intended is a tax saving. Sell your soul to the devil the productivity of the indicators.

### Editor in Engineering:

Evaluation policy is focused on citations, yes, indeed, and if that measures the quality and actual value, which it does not. Not at all, because that is not the value, and it is not

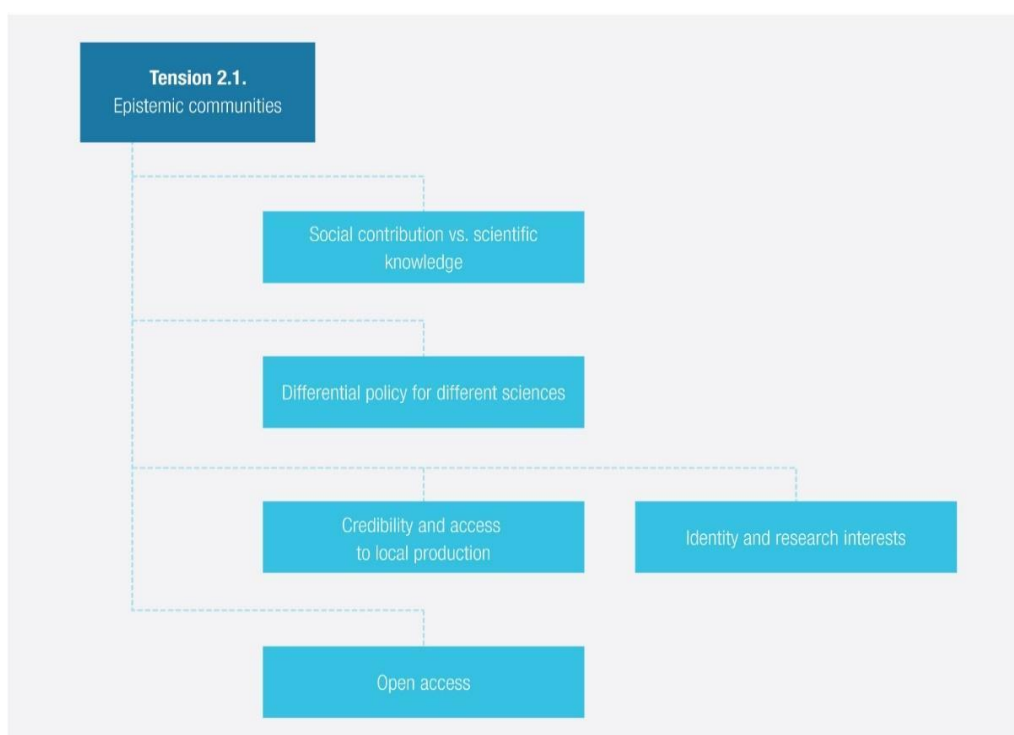
the time. That is another criterion that you produce how much is translated into a product of value. There is a change for one social group. For one health condition, something else is another criterion.

## Tension 2. Index-Journal effects

### Tension 2.1 Epistemic communities (PUH)

Social contribution vs. Scientific through open access, credibility, and local knowledge access (see Figure 41).

Figure 41. Epistemic communities, local vs. international construction (PUH)



Source: Created by the author, with Atlas.ti, based on semi-structured interviews

### Research Vicerrector:

We must understand that this is an integral chain, knowledge is a chain, and no sufficiently solid applied knowledge is produced. That is the famous tree of knowledge, where the root is the basic knowledge; technological knowledge is the trunk; innovation knowledge is the branch. If I only have roots, I don't have fruits, but I don't eat from the roots, so if I have fruits, will they hang? Not everyone in Minciencias has it. Everyone



talks about how the party is going, but a much more comprehensive view is required from the legislative bodies. Let's talk about the management and development of science, technology, and innovation.

#### Incentives Office:

“The social sciences are making a more important contribution to local development and to solving problems that are for all intents and purposes. The responsibility is hard sciences but is not being penalized because this ends up being a social stratification.”

#### Research in History:

Research organizations are evaluated by measuring quantitative indicators. If you do not classify with an exact Sciences research schedule, your project is not long-lasting, it does not have a place in the community, so it seems that it is a challenging situation of research in Social Sciences. It is not that one does not have the time nor desire. That reconciliation between Social Sciences and Exact Sciences, particularly in the applied part, has indisputable social effects. We do not look at what deeply integrates those two fields, be more cordial and more generous in the intra-academic or intra-knowledge dialogue. More multiculturalism is genuinely essential.

#### Editor in Social Science Faculty:

Sitting way out front is the psychoanalysis Journal director, Lacanian psychoanalysts. It is sold more in Argentina, Mexico, and France than in Colombia. It has many citations, but the problem is that there are not many indexed and fewer Lacanian journals in psychoanalysis. Note, you can publish very high materials, but they will never enter the mainstream circuit. They are Journals that will never enter the Colombian index.

#### Editor in Biotechnology:

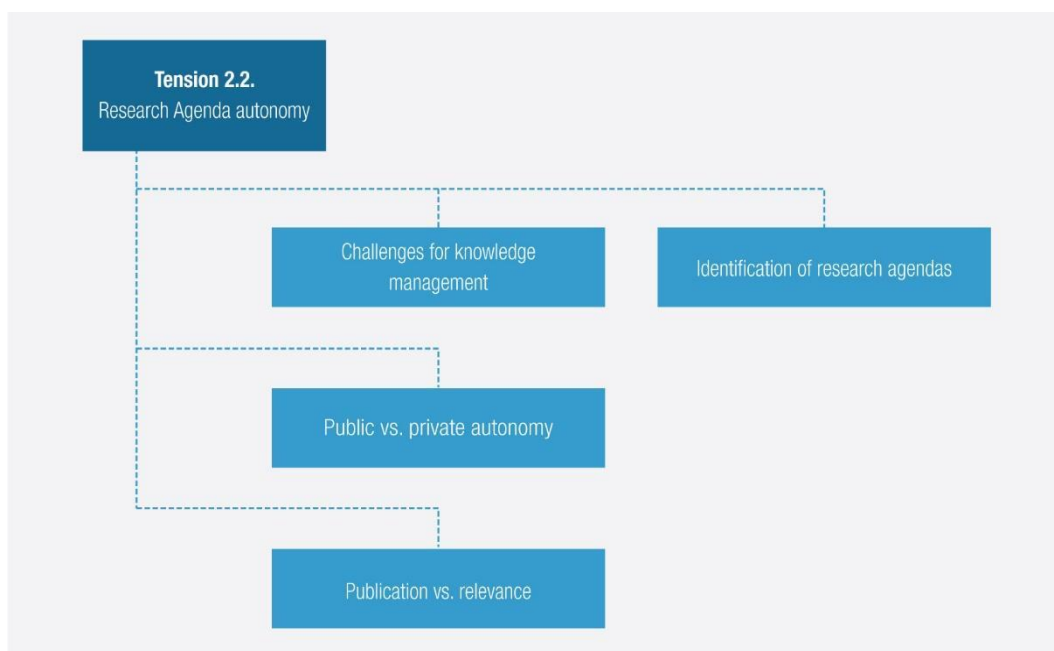
According to the discipline, the problem that Minciencias has not yet solved is asymmetry, heterogeneity, and inequity in the different types of knowledge. The underlying model is that of Basic Sciences, and I'm telling you this because my doctorate

is in Basic Sciences, but I also work with social sciences, with people who work in basic sciences. Where does that reflect? Simple. In that case, Minciencias has not solved this Gordian knot because this type of discussion is manipulating and not even directed. The basic sciences that have turned their backs on the country for a long time are manipulated by a very orthodox policymaker who came from basic science; some people live in another world, the great majority of them, that is the little problem.

## Tension of 2.2. Research agenda autonomy (PUH)

The challenges are the identification of research agendas concerning public vs. private autonomy (Figure 42).

Figure 42. Research agenda autonomy (PUH)



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

### Research Vicerrector:

The university tried to reach the knowledge agendas through a mechanism I call knowledge agendas to show the issue. It is a look from the university to see what issues it was interesting—conceived the construction of this agenda from a missionary perspective. These were spaces of collective construction and articulation and visions

of the future that integrate the university's capacity of science, technology, and innovation to specific fields of interest for development and the best state of contemporary society. We are not thinking about rankings.

#### Research in Civil Engineering:

For example, I came to the IPCC (Intergovernmental Panel on Climate Change). I told them that the most well-published information on risk management globally was not in the northern hemisphere Journals or English. They told me that "that was grey literature," and I said, "Okay, let's see who has the best literature inside." But we changed one significant thing. They wouldn't accept it! So we made a report in 2012 and then again in 2014 under that rather unfortunate, pejorative grey literature name. Finally, however, they received a mechanism for the grey literature to enter the IPCC.

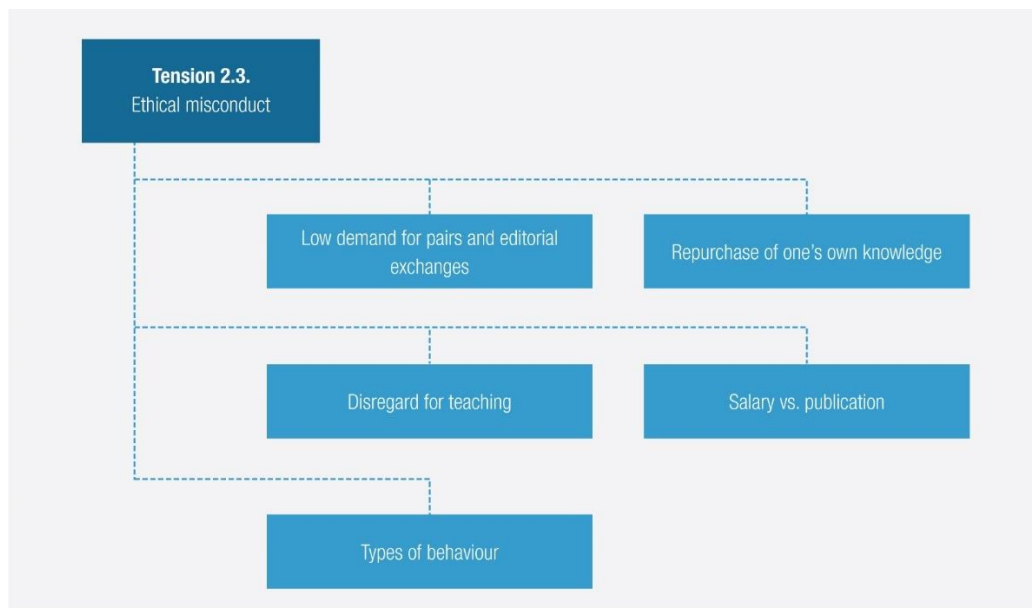
#### Editor in Social Science Faculty:

I believe that a mixed phenomenon is going to happen. It depends on the area of knowledge of each research group. For example, in the Colombian Journal of physics faculty, one of the most cited Colombian scientific articles in Colombia, theoretical physics is positioned at the science frontier. It is happening with a Journal that provides technological solutions for the Colombian agricultural sector, a system of disinfection of the cape gooseberry to avoid such a fungus. The product's obsolescence does not matter to anyone in the world. Still, it can have a powerful impact on the productive system and the generation of profits, and we are talking about science. An article published in an anthropology Journal on the rituality of training child combatants in the FARC guerrillas was the object of an anthropological investigation. The article was published. It does, however, raise a pertinent question: What incidence will this have?

### Tension 2.3 Ethical misconduct (PUH)

According to the interviewers, the tension is related to assigning the salary vs. publications, creating pathological behaviour in scientific production knowledge (see Figure 43).

Figure 43. Ethical misconduct (Publish or perish) (PUH)



Source: Created by the author, with Atlas.ti, based on semi-structured interviews.

### Research Vicerrector:

All the universities in the world are trapped in that kind of created mechanism in which we produce research, pay for publication, and then buy our knowledge. It is a crazy and costly thing. This university has spent the vice-rectory budget; 30% goes to databases that are knowledge produced by other universities. That is to say, we pay for knowledge, and the universities pay because we produce, and in the end, who wins? The middleman, basically Elsevier, has been getting bigger and bigger. There seemed to be no way out of this process because we always look for the most advanced article to avoid repeating the research and cite. So we have to devise a mechanism by proposing networks of universities that begin to publish from the outside and achieve and share without paying those who publish us, right? It's also a business. Publishing an article in a top journal can cost you 3,000 dollars, a crazy amount to publish. Still, a regular Journal pays 3,000 dollars. They are crazy things that happen to us. It's also a business; publishing an article in a top journal pays 3,000 dollars. They are crazy things that happen to us.

### Incentives Office:

There may also be professors who are the point, others that are very refried because they also see the same subject and even the exact text in several products. But there

are also professors who I think are a scheme of those who publish but are more interested in strengthening their area of knowledge. As I told you, the indicator and the incentive are already a result, not an end.

### Research in Pharmaceutical

The researchers were telling lies surely manually, and you know that report 600.000 invented data en Scienti. Only the articles find thousands of data that did not correspond, but 600 false data. All of this has to do with the same thing the scientists know that Science is not the Pharmacy Journal level, and even so, they fight. They lose their status because they lose the salary product.

### Editor in Social Science Faculty:

I believe that they occur for two reasons, one for the ethical formation of the researcher. Those plagiarism and cronyism cases occur more with the older researchers, new people, and new doctorates who arrive. The great brooms that arrive sweeping super well are impervious to this cronyism, and they come better formed at an ethical level. On the other hand, professors, research groups, the same publication goals, and even the salary factors are also the pressures of publication. You know that in many public and private universities, there are salary points for publication. Hence, these are all conditions that sometimes threaten scientific quality. There is a severe problem with the Brazilians, so it became obligatory to run the anti-plagiarism software to accept it. The Brazilians used to practice overlapping publications in Portuguese and Spanish. We fought so that the Vice-Rector of Research would buy enough licenses for all the faculties because we have a severe problem. Especially with our beloved Latin American colleagues, the most dangerous of all Brazilians translate it into Spanish. They change subtitles. Still, it's the same, and you know how you catch it by the dates because they have a system of points very similar to ours, then everything that comes from country universities and that, batteries, I always say pick it up with tweezers and first submerge it. We have recently had 6, 7, 8 cases of plagiarism in the different Journals of the faculty, denominated the Brazilian phenomenon”.

### Research in Biotechnology:

“If there is a considerable interval or teachers who repeat the same content. Turn it into an umbrella in different places, publish it in English, post it in Portuguese, publish it in Colombia, publish it in a congress. Congresses and articles give a bonus. All the scientific exercises and disclosures are currently permeated. Beyond permeated, I would say that if one could say almost contaminated by remuneration in Colombia, one does not put a discussion or an interpretation or something that reorients the academic exercise. If you don't put parole in 1279 and 1479, many things are not going to change. Yes, because the dissemination of knowledge is firmly, clearly, when you speak of academics immediately, the martyrs of impunity appear. No, no, but how so? Are you talking about something that isn't true? We're genuine. That's what happens to you. Everyone starts to do very neat, dignified, bone, very bad-toned speeches, even very ethical. Still, when you look at the scoring committees, what's going on, then you look at what hurts people, or how those scoring machines increase, yes? The vast majority of the academic community in this country, of all disciplines, are heavily contaminated because it is impossible for you, every time you receive this salary, not to realize that it is impossible, yes? In fact, on the theme of sustainability, there is a documented one that was published. Announced that the public university had an operating deficit from two years ago, which rented the salary share of 4 billion. Two years ago, it was 6 billion this year. It was 48 billion. It is estimated that it will be 125 billion by next year”.

To summarize (PUH)'s case, the government has promoted institutional scientific journals and supported the Publindex program since its creation, which is why it has the most significant number of publishers of scientific journals in different disciplines. Due to its mission to conserve and maintain the national heritage, the development of national journals' protection has been a priority. Within the institutional logics, it has been given by the decree 1279, which has marked the issue of points per article published in scientific journals, which is reflected in the salary issue, a regulation that has been given for all public universities, an incentive that has been in place for more than 19 years, generating some moral risk in terms of the progress of the incentives of research evaluation, but also terms of budgetary support of public higher education institutions. The interviewees denote that the central tension is the tension of ethical conduct given by scientific production incentives.

### 6.3. Case Comparative Analysis

This section describes the comparative cases of each of the institutions. From the fourth perspective, first, quantitative analysis in terms of journals data; second from the perspective of the university research governance, taking into account the three measurable components of institutional change Governance, institutional logics, actors; third contrast of the narratives of the actor's directives, managers, researchers, and editors; fourth university cases comparative by tensions. The results were analyzed for each university in response to each tension. The case study results per university are shown below. Allow contrasting the research question between the cases.

*How do university research governance actors respond to the internationalization-driven tensions and Publindex's policy changes and determine the points that should be emphasized to alleviate them?*

Table 20 and figure 44 describe the number of the journal in Publindex per institution, in the case of PRUS. Since the creation of the index instrument, the institution developed a program to index the journal. Perhaps in the last couple of years, the index journals have decreased. Some of the journals disappear. The main reason is related to the internationalization process to publish articles in international databases and journals. In PRUE, the policy of index journals has been more conservative, with fewer journals and more presence in the international databases. Relating to (PUH) as a public university, the denomination is the factory of journals. The university with more journals indexed in Publindex; perhaps, the number decreases are the main reasons the international and metrics requirements form the Publindex instrument in the last couple of years.

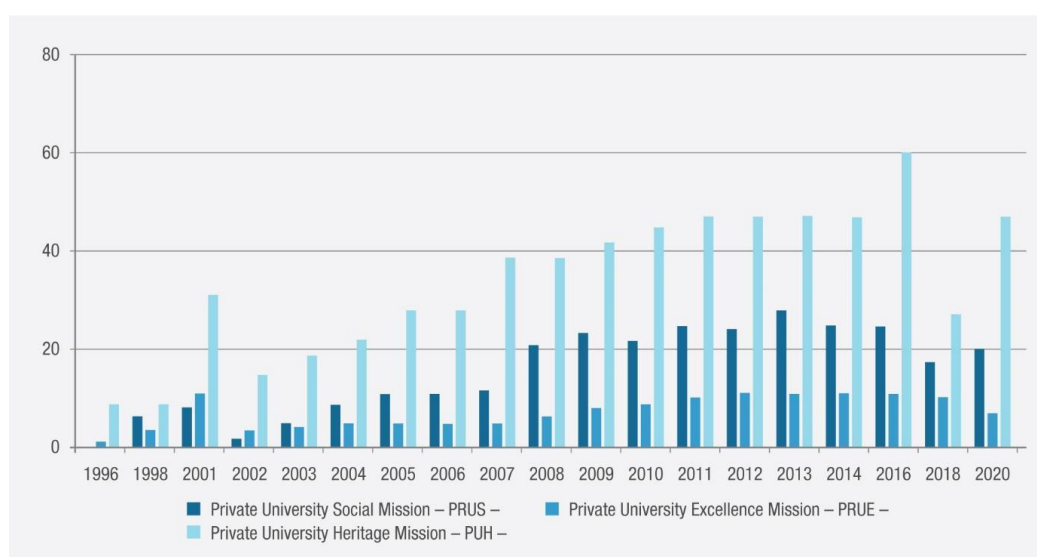
Figure 45 samples the scientific articles published in the databases as Wos, Scopus, and SciELO in the institutional cases selected. The database-less representative is SciELO, the institution with more articles is (PUH), PRUE has minimal representation in SciELO, and PRUE prioritizes Wos and Scopus. The database that is more representative is Scopus.

Table 20. Colombian Scientific Journal Index Publindex. Selected institutional cases

YEAR / INSTITUTION	1996	1998	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2016	2018	2020
Private University Social Mission - PRUS -	0	6	8	2	5	9	11	11	12	21	23	22	25	24	28	25	25	27	20
Private University Excellence Mission - PRUE -	1	3	11	3	4	5	5	5	5	6	8	9	10	11	11	11	11	10	7
Public University Heritage Mission - PUH -	9	9	31	15	19	22	28	28	39	39	42	45	47	47	47	47	60	27	47

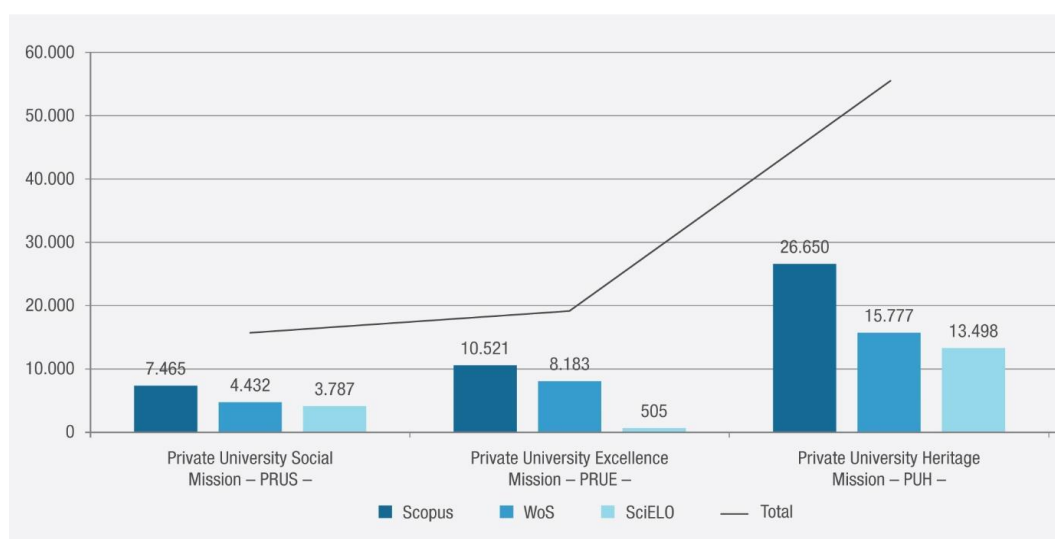
Source: Created by the author, Publindex data, 2021.

Figure 44. Colombian Scientific Journal Index Publindex. Selected institutional cases



Source: Created by the author, Publindex data, 2021.

Figure 45. Scientific Production in Databases Wos, Scopus, SciELO per Institution



Source: Created by the author, Scopus, WoS, and SciELO data, 2021.



Table 21 shows a comparison between the institutions concerning the three measurable components of institutional change.

In terms of governance is mediated by the mission and values of the institutions. The case of PRUS has focused on the institutional capacity of scientific journals. In PRUE, governance has been decentralized and focused on internationalization and the highest possible quality standards. In the case of (PUH), institutional governance has been to follow the national model of Publindex. The exponential growth of institutional scientific journals has been very high, calling it the journal factory, where each faculty develops its editorial programs.

In terms of institutional logic, the politics and regulations to concrete policies, mission, and value of the institutions have been shown through incentives, in PRUS, combined with an institutional logic of incentives between the national and international contexts. In PRUE, its institutional logic has been based on the incentives for scientific production defined by the faculties according to the disciplines' quality logic. Finally, in the case of (PUH), the institutional logic has been mediated by decree 1279 that governs public universities, where a moral risk is evidenced by an incentive generating distortion and exponential increases in the payroll of public universities for more than 20 years.

In terms of the actor, narratives respond to institutional governance, and logic generates tensions of friction internally. In PRUS, among the actors, the friction is between disciplines where the social sciences, arts, and humanities do not feel represented in the evaluation models of scientific production. In the case of PRUE, an asymmetry or inequality of incentives between areas of knowledge is evident. In (PUH), the main friction evidenced by the actors is the moral and ethical risk of the incentive of decree 1279, which triggers a phenomenon called by the actors in predatory behaviour.

Table 22 summarizes the actors' roles within each university setting. Given the different roles within the institutions, the actor's narratives' narratives change.

Table 21. Comparative analysis cases Institutional Measurable Components

Measurable Components	PRUS	PRUE	PUH
<b>Governance</b>	Centralize office to coordinate scientific journals indexation and editing	Decentralize per faculty, and the main goal is top quality. Every department defines the criteria of quality.	The development of scientific journals by faculties, institutes, and research centers has grown in a decentralized manner. The number of scientific journals has been very high.
<b>Institutional Logics</b>	Incentives regulation to play both national and international contexts. Perhaps the last regulation is more internationally oriented.	Focus their policy on the highest international standards. Develop quantitative and qualitative regulation to evaluate research. Incentives and bonifications.	The regulations related to scientific production as an incentive is the decree 1279 June 19 de 2002. It establishes the salary and benefit system of the teachers in Public Universities.
<b>Actors</b>	Strong editor journals community. Research from social science, art, and humanities concert with international incentives or regulation.	Strong editor journals community. Research from social science, art, and humanities concert with international incentives or regulation. The priority is international excellence; each of the interviewees identified with the line of distinction and internationalization. The tension friction is in finding the balance of incentives and evaluation criteria by discipline.	The tension remark was ethical misconduct concerning the behavior publish or perish.

Source: Created by the author through the interview analysis.

At the directive level, PRUS seeks that policies and regulations comply with a balance between local and international scientific communication circuits; for the PRUE institution, the priority is an international approach, where scientific production is reflected in high-quality communication channels; at the (PUH) institution, they have built a policy that supports the Publindex model with a perspective of preserving national knowledge, where the communication channels of scientific production are between disciplinary and local communities according to the context.

At level two, managers search for mechanisms and tools to comply with the university's mission, policies, and regulations. In the case of the PRUS institution, there has been a search between the positioning of institutional journals and incentives that support the positioning in international rankings; in the case of PRUE, the approach has been through incentives and bonuses adjusted by publications to meet the highest levels of excellence and quality, the managers themselves warn of the imbalances in the incentives by areas of knowledge, which should seek ways to make adjustments; In the case of (PUH), the main restriction they find to advance in the diversification of scientific production is decree 1279, which does not allow them to advance in other products such as innovation or social impact.

At level three, editors have had to face the most changes and pressures in the institutional policies of scientific production since they directly affect the role and functioning of scientific journals. In the case of PRUS, editors have felt the disincentives to continue strengthening institutional journals; priority has been given to institutional journals that have managed to remain in the indexing systems of Scopus and WoS; institutional incentives have changed, and journals that are not indexed in international indexes are no longer given points for the ranking. This has meant that the journals that have achieved the objective of international indexing are being maintained by giving them resources for sustainability and the journals that have not achieved this objective have been progressively disappearing or changing their audience.

In the case of PRUE, the number of journals indexed in Publindex is deficient. Those that have achieved are indexed at the international level with the highest quality standards, trying to maintain a level of quality for the discipline by maintaining border discussions, the editors continue to do solid work to maintain the standards and work teams, some journals have changed their audience and have become more focused on dissemination to students or the general public, the community of editors of this university is tiny, and they have all the institutional support to maintain the publication in technical and budgetary terms.

In (PUH), this university has approximately 60 editors of scientific journals with their respective editorial teams. The narratives are wildly divergent by areas of knowledge in terms of indexing systems. Some editors affirm that if the journals should seek indexing in international systems, there is no sense in the national indexing in Publindex, other editors more in the area of social sciences, arts and humanities defend the dissemination at the national and local level that allows protecting in terms of intellectual property the patrimony-heritage of the national scientific production. However, with the latest policy guidelines focused on Wos and Scopus quartiles, many institutional journals have been de-indexed from the Publindex program, affecting the publication of articles in these journals because researchers seek indexed journals that comply with the incentive measures of decree 1279.

At the level of researchers, there are also many divergences, which depend on the disciplinary perspectives and institutional logic in the models of production and evaluation of knowledge, which shape the patterns of behaviour in research products, in some

researchers in certain areas of knowledge such as social sciences, arts, and humanities there is some resistance to the models of evaluation and production of knowledge, in areas such as basic sciences they feel that the evaluation model is consistent with the practices built from these disciplines.

In the case of the PRUS institution, for researchers in the social sciences, arts, and humanities, there is resistance to the models of evaluation and production of knowledge, they call it colonialism of science, for researchers in the basic sciences they feel more identified with the model of knowledge production, which they consider to be universal for the sciences. In the case of the PRUE institution, there is a narrative coherent with the institutional logics of the highest academic quality by discipline, they see with the good disposition that each faculty can build the quality criteria based on the context of the discipline, and they comply with the coherence of reputation and international visibility. Thus, there are powerful narratives between researchers in the social sciences, arts and humanities, and the (PUH) institution's basic sciences. The former considers a salary stratification given by decree 1279. The primary beneficiaries have been basic science researchers, who have also been policy decision-makers to build evaluation models with these biases.

Table 22. Case comparative multilevel analysis, actor's narratives

Actors	PRUS	PRUE	PUH
<b>Level 1 Directives</b>	They seek a balance between international pressures and local disciplinary contexts.	Focused on excellence from an internationalization perspective.	Conservation of heritage according to the mission of the institution, curation the local content of disciplinary communities.
<b>Level 2 Managers</b>	Seek to comply with the internationalization requirements about the scientific production indicators of the rankings.	Institutional policies focused on excellence and internationalization according to the discipline.	Balance in the construction of quality local knowledge according to national evaluation mechanism Publindex Policy.
<b>Level 3 Editors</b>	Focused on building disciplinary and regional scientific communities.	Excellence from the international quality.	Strong editor community interesting to develop local and regional knowledge by discipline.
<b>Level 4 Researchers</b>	It depends on the discipline changes perception for those of science internationalization is vital. There is a value of local legitimization and discipline (they use the colonialism of science to make the criticisms).	They are not interested in the local Publindex regulation but in international positioning and reputation.	It depends on the discipline; they have different narratives. Basic scientists consider that knowledge is universal and communicates in English. The key is to cure local knowledge for social sciences, case of disciplines as law, history, or sociology of science.

Source: Created by the author through the interview analysis.

Table 23 describes a comparative matrix made with the three case studies, which can serve as a dynamic tool for self-evaluation with scientific production to determine where capacities/capabilities need to be reinforced.

Hereunder each of the tensions comparative descriptions (see table 21 and 22):

Tension 1.1. Internationalization. Scope and limitation Publindex. Internationalization Indexation. PRUS has been an organization that has legitimized the Publindex indexing process since its creation and has achieved excellent results in the international indexing processes. However, the resources used for multiple indexing have denoted a duplication of indexing resources. With the changes in indexing policy and categories, the institution has felt that the Publindex policy is unclear on the same objectives, losing the installed capacities and the learning acquired in the research production process. In the case of PRUE, the general conception of the international limitation of Publindex, the actors prefer to play in the international index system more than the national. In PUH, this is one of the universities that has contributed the most to developing journals indexed in Publindex. However, with the Publindex policy changes towards an internationalization model, some editors consider that the existence of Publindex is no longer necessary. If not with the indexing in international systems, this statement has dualities related to national knowledge protection.

Tension 1.2. Indicator as incentives. In PRUS, there is a consensus in building incentives by areas of knowledge, including local relevance and a balance between activities such as research and teaching. In PRUE, there is a diversity of incentives between research, consultancy, and teaching to maintain motivation to publish. Some disciplines are more attractive doing consultants than doing research and publishing articles like business management or engineering. Some research mentions the cost benefits in terms of time and money. In PUH, the main restriction is decree 1279, which restricts incentives to other modes of scientific production such as innovation or others. The main challenge is the scale of implementation in various incentives to be inclusive.

Tension 1.3. Evaluation Mechanisms. In PRUS, the evaluation and research mechanisms are essential for the progress and development of research. The problem lies

in the representativeness of knowledge areas such as social sciences, arts, and humanities. Examples such as law, philosophy, arts, and music are not representative in the evaluation models. The PRUE's critique points out the general measurement considerations and the specificities per the local and disciplinary context. In the case of PUH, the organization's actors recommended creating an evaluation mechanism to contextualize the institution according to the capabilities, historical learning process developed to determine alternatives to measure quality, disciplines, and context.

Table 23. Case comparative tensions, Tension 1, involves assessment factors

Tensions 1	PRUS	PRUE	PUH
<b>Tension 1.1. Internationalization</b>	Redefine the criteria of categorization to contextualize per discipline. Define the goal of Publindex policy to Colombia's context.	The interviewees consider that Publindex has limitations for the university's international quality standards; for this reason, the institutional policies behavior of knowledge production is outside the guidelines of Publindex.	The interviewees consider the national policies have marketed the knowledge, which generates an institutional inability to retain researchers.
<b>Tension 1.2. Indicators / Incentives</b>	The actor's remark on diversity incentives for natural and social science includes local relevance and balance teaching vs. research.	The challenge in the institutional policy implementation for the PRUE is the diversity of incentives between research, consultancy, and teaching to maintain motivation to publish.	The main challenge is the scale of implementation in various incentives.
<b>Tension 1.3. Evaluation mechanism</b>	Measurement consideration is essential to develop the scientific community. The representativity per area of knowledge change significantly, e.g., philosophy, law, literature.	The critical points are the importance of measurement consideration in terms of excellence and pertinence per discipline.	It is crucial to analyze value assignment alternatives to measure quality, discipline, and context.

Source: Created by the author through the interview analysis.

**Tension 2.1. Epistemic communities.** In PRUS, the most significant concern is given by the credibility and accessibility to knowledge in local communication channels. Some researchers feel that the national community works on their topics. Others consider that their topics do not have a replica of dialogue discussion in the national context or vice versa. Some consider that the topics are of national relevance and do not have dialogue in international contexts. In PRUE, Managers are aware that each area of knowledge has different ways of producing and disseminating knowledge. Therefore, the criterion is quality but follows the construction of knowledge of each of the epistemic communities. In the case of PUH, Concerning the construction of epistemic communities, one of the restrictions encountered by this institution's actors is the accessibility to knowledge and legitimacy in terms of relevance before the local or regional scientific communities.

Tension 2.2. Autonomy in research agenda. In PRUS, the autonomy of research in the different epistemic communities has been affected by the indexing models that prioritize commercial topics or call it the hot topic in the indexing process. Some researchers illustrate examples for different areas such as basic sciences, medicine. In PRUE, the interviewees considered it was challenging to build a research agenda that meets international quality standards and the challenges of local social issues in terms of relevance. In PUH, the institution's challenge is finding a research agenda independent of private corporate interests or decree 1279.

Tensions 2.3. Ethical misconduct. In PRUS, there is a consensus on the importance of building ethical guidelines that allow finding the limits in knowledge production behaviour. According to institutional logic with high quality in international standards, the actors consider ethical standards challenging PRUE. In PUH, public universities' problem is the ethical behaviour from publishing or perish pressure, where the actors mention a pathologies behaviour to create perverse results in terms of misconduct in scientific production.

Table 24. Case comparative tensions, Tension 2, involves index journal effects

Tensions 2	PRUS	PRUE	PUH
<b>Tension 2.1. Epistemic communities</b>	Redefine the criteria of categorization to contextualize per discipline. Define the goal of Publindex depends on the relevance of the topic, reframe the possibilities of funding and visibility to be cited. For that reason, more commercial or hot topic, generate possibilities.x policy to Colombia's context.	The respondents consider there is a challenge for knowledge management to identify research agendas with relevance and quality.	The challenges are the identification of research agendas concerning public vs. private autonomy.
<b>Tension 2.2. Research Agenda autonomy</b>	Measurement consideration is essential to develop thThe main issues in terms of the epistemic communities' tension are the credibility and accessibility of the local knowledge production. The friction to building local vs. global knowledge.e scientific community. The representatively per area of knowledge change signifi- cantly, e.g., philosophy, law, literature.	For this institution, the priority is quality in scientific production. For that reason, they are working on a differential policy for different science at the managerial level to achieve credibility per discipline.	Social contribution vs. Scientific through open access, credibility, and local knowledge access.
<b>Tension 2.3. Ethical misconduct</b>	Publish or perish create types of behaviour, including the repurchase of one's knowledge. A possible solution is a demand for pairs in editorial challenges.	The purpose of the university is publishing to export quality of knowledge to define the types of behavior.	The tension is related to assigning the salary vs. publications, which creates pathologies behavior in scientific production knowledge.

Source: Created by the author through the interview analysis.



## 7. CONCLUSIONS



## 7. CONCLUSIONS

This thesis set out to determine how university research governance actors respond to the internationalization-driven tensions and Publindex's policy changes, aiming to identify points for alleviation. To this end, and after establishing the main tensions, a comparative analysis of three types of universities with a specific conceptual framework centered on three measurable concepts of institutional change<sup>28</sup>: institutional logic, governance, and actors (Scott, 2004) was conducted to determine the tensions' arising from the implementation of the Colombian scientific journal Index "Publindex" and its effect on each one's behaviors and products in the actor's responses.

This section summarizes the main issues affecting the general state of scientific journal publishing in Colombia. It begins with the conclusions on the drivers of the pressures, followed by the comparative conclusions for each studied institution and the actors. Finally, this document offers some recommendations on how to alleviate the effects of the tension between Internationalization and Publindex's policy changes.

### The drivers

Databases such as WoS and Scopus have played a leading role in research performance visibility and the ranking of institutions based on specific indicators of knowledge production. Thus, about a decade ago, as part of the internationalization strategy, the Colombian Ministry of Education initiated a partnership with Scimago to promote research visibility in the Scopus database. The agreed program, in effect, prompted an adjustment of the Colombian national model to align with international standards. As a result, University journals have been reacting to quickly achieve inclusion in Scopus Elsevier, an international indexation system that standardized analytical information despite its pitfalls.

However, it has excluded a high percentage of national scientific journals. According to Beigel (2020), "of 10,000 scientific journals currently existing in the region (Latin-

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<sup>28</sup> According to Scott (2004), "In tracking institutional change empirically, we found it advisable to focus on three measurable components" p. 22.

American), most are university-based and are indexed in regional portals. Only 2.3% are indexed in Clarivate and 8% in Scopus" (p. 12). Nonetheless, in Latin American, the research evaluation models have systematically ignored regional developments such as the Redalyc and SciELO repositories, databases that, despite containing a significant part of the region's scientific publications, have not yet developed the usability and data processing mechanisms offered by WoS and Scopus.

In Colombia, Minciencias' Publindex has had a fundamental role in improving the editorial quality standards of Colombian journals. Publindex's national science and technology policy has seemingly succeeded in becoming an index to evaluate and rank scientific journals in Colombia, driving the professionalization of scientific editors and developing a collection of 600 national journals. However, according to Charum (2004), the purpose of the Publindex instrument does not achieve two of the fundamental goals for a system of this type. It has failed to:

(d) become the national bibliographic base that preserves the structured memory of the production of research results circulating in national journals by replenishing it permanently and making it publicly available to all interested parties, thus increasing its visibility and accessibility; (e) is conceived as an information subsystem where information circulates to and from the other information subsystems of the national science and technology system. (p. 298)

The documentary information in Publindex is mainly used to categorize journals and does not fulfill the actual purpose of being an information system. According to Visser et al. (2020), a bibliographic data source's value is how the data is made available. The ideal data source provides comprehensive coverage of the scientific literature and offers a flexible set of filters for making all kinds of literature selections (p. 21). Unfortunately, the Publindex system does not provide analytical information to recognize the usability of the data inside the Publindex system as Scientiometric analysis or improvements of and overlooks the challenges faced by journals in terms of digitalization and analytics.

Furthermore, there is a lack of coordination between Minciencias and the Ministry of Education to define an agreed model of evaluation to include standards, incentives, and

the structure of an information system that while encouraging scientific production, and specific to align requirements in terms of Publindex index system in terms of the relationship of the journal categories and the Decree 1279 salaries' point incentives.

In short, the national bibliographic database "Publindex" fails to allow information access to building indicators based on, resulting from the state of science in the historical context of national journals' production system, the main advantage is to know the development of epistemic communities as well as the use of national knowledge within the Publindex system. Instead, it creates a dilemma between local and international journal indexing systems and generates tensions in the governance of the higher education system and the STI systems.

Although the number of local scientific journals included in Publindex has grown for several years, the eagerness to be part of the Scopus database has reduced the number of journals in the national index. This decrease has had negative implications for disseminating knowledge and strengthening epistemic communities. Furthermore, this phenomenon has impacted that new linguistic terms have risen: "epistemicide" for describing epistemic homicide and "journalcide," describing the disappearance of journals. These terms appeared during a publishers' conference in Cali, Colombia 2016 (Annex 5), and the concept has been developed in the literature on cognitive injustice by de Sousa Santos (2010).

For public universities, scientific research production indicators have been anchored to the Decree of salaries and incentives performance (Decree 1444 of 1992; Decree 60 of 1995; Decree 15 of 1996; Decree 2912 of 2001, and Decree 1279 of 2002), which has become problematic. This Decree issued over 19 years ago dictates wages for researchers upon scientific production (articles) within the Publindex categories as the leading indicator. According to the incentive theories, an incentive that does not transform in time according to the evolution of production, popularization of scientific communication and technologies, or the processes themselves, leads to perversion. For example, Campbell's law, which states that "The more any quantitative social indicator is used for social decision-making, the more subject it will be to corruption pressures and the more apt it will be to distort and

corrupt the social processes it is intended to monitor" (Campbell, 1979, p. 85), corroborates this affirmation, involving incentives, this situation yields phenomena such as moral risk (Krugman & Wells, 2006), social trap (Dembe & Boden, 2000, p. 257), and the tragedy of the commons (Hardin, 1968, p. 1246).

International requirements drive the pressures, and the sometimes- controversial efforts of the national system to respond to them have produced tensions at every level of the national scientific journal production structure. Moreover, moving from a purely national model to an international model using no-context based-evaluation indicators has increased ambiguity in the evaluation system. It has also generated a disassociation between publishers and researchers and promoted an unhealthy incentive scheme for scientific production in universities. Thus, using these indicators as the sole factors to assess research, researchers, and institutions is risky, and commercialized rankings jeopardize its validity.

### **Rankings**

The metrics used for the international validation of journals are inadequate to reflect local research conditions and stretch the existing system established within each institution's context. According to Cambrosio et al. (2020), in her book on digital sociology, Noortje Marres faced with the question of whether the investigation of digital regimes requires the development of new methods, she points to the presence of both continuities and discontinuities between traditional and recent quantitative approaches. She therefore pleads for the adoption of "interface methods" that specifically interrogate the relation between different methodological traditions, including qualitative ones. Her proposal is a useful antidote to the careless way in which "much computational social science projects simply go along with whatever ontology, epistemology or methodology is wired in to the platforms, packages or tools they use to capture, analyze and visualize data, without querying whether and how they are appropriate to the research project at hand"

The construction of the ranking and their over-stated meaning, i.e., with narrow focus as citation impact, squander the entire research endeavour, excluding the assessment of research processes and the contextual analysis within which the research

occurs. Furthermore, increased international ranking usage generates homogenization and reduces the possibilities of doing context-based research, regional and disciplinary knowledge, and diminishes research autonomy. However, the ranking issue is not only about using them as a parameter to assess research but also about the methodology to construct them, even when the ranking is context-based.

According to Waltman (2017), scientometrics goes beyond a journal's impact factor or H-index. It "provides multiple analytical possibilities of data capable of revealing the different values and dynamics of research (trends, scenarios, collaboration, funding and funders, reception of social media, altmetrics, etc.)" (Costas, 2020)

Next is a summary of how Colombian institutions respond to the governance pressures. Finally, a comparison between PRUS, PRUE, and PUH is presented at each of these three levels: institutional logics, governance, and actors.

## The institutions

### *Institutional logics*

The institutional logic of a university defines the mechanisms for evaluating scientific production, which shapes the behaviour of researchers in the production and dissemination of knowledge. For the PRUS, incentive policies have been transformed over time; however, they respond to external political expectations, contributing to frictions between managers and researchers-editors, i.e., the action of transforming is positive, but the purpose is somehow erratic. For the PRUE, incentive policy is focused on quality and excellence according to international standards, making research more easily comparable according to international parameters. Still, institutions' narratives show a disconnection with local epistemic communities. Finally, for the PUH, the institutional policy for 19 years has been anchored on decree 1279 of 2002 for salary incentives. Although it had a well-intended purpose to encourage research production in quantity and quality, sustaining the same scheme for almost two decades creates ethical and financial risks for the institution.

## Governance

Regarding governance, the PRUS has a centralized system to coordinate the editorial process and indexation of internal scientific journals. The editors' responses are positive in harmonizing the institution's technical process. However, given that editorial responsibilities are assumed by researchers as part of their contractual agreements, friction arises due to the lack of recognition of these duties, i.e., time and effort spent on this are not accountable for career progression. Contrary to PRUS, PRUE has a decentralized process. Its primary mission is excellence in publication. Every faculty defines how to publish according to the discipline's excellence and international quality criteria. Therefore, each faculty has a different publishing strategy, which is desirable. However, given that publications are easy and faster in some areas, it is not the case for all disciplines. Thus an unbalance of bonifications programs is created. The PUH has a decentralized governance system, where each faculty is free to create journals, resulting in a high number of journals and duplication of related processes, promoting budgetary issues and ethical misconduct. On the other hand, given that these journals are indexed in Publindex, a local indexation system, knowledge sovereignty is preserved by authors to a great extent.

## The main issues for the actors

Research managers across the three institutions agree on the pressures of external governance imposed by the rankings, national and international evaluation models, and the results expected in these systems by institutions' government bodies. Thus, the challenge is to build institutional policy instruments that mediate between the organizational mission and national or international indicators' requirements.

For researchers, the main issue is the loss of acknowledgment of discipline-specific modes of production and dissemination, which has resulted in the standardization of dissemination models. For example, the implementation of regulations in Jurisprudence or case studies in consultancies in Engineering. Some researchers have called this "epistemicide."

For the editors interviewed, Publindex's national model has transformed through the years and increasingly responds to Colombia's scientific production demands. Turning social activity magazines into academic journals, with the rigor of scientific methods and peer review, has strengthened the research and writing processes in the country. However, the lack of recognition regarding workload and salary recognition in bonuses has led to high rotation. Professionalizing editors' careers is a positive way to legitimate the scientific editor community. According to the editor survey in Serna Ruiz et al. (2019)

There is a widespread call for a bottom-up model that recognizes local production and discipline. In the editors' words, the main complaints are the lack of professionalization and consensus, the lack of tools, the time allocated to the editor to carry out this work, the lack of professionalization of the profession of being an editor [sic]. (p. 266)

The best practices to use metrics are building institutional capacities based on historical metrics with the internal sources using the repositories and internal information systems (current research information system) to tracking disciplines' developments, and identifying those indicators that have been implemented in an inclusive institutional context to understand scientific communities and network analysis according with the values and research agenda of the institution.

### **Balancing the tensions**

Understanding the governance of the scientific journal production system from both top-down and bottom-up perspectives has allowed us to analyze these system's dynamics concerning universities' governance and their actor's response to the external pressures of the market and the tensions they create.

In this study, tension around research assessment factors (Tension 1) and tensions in the context of indexation of journals (Tension 2) are means to understand the adverse effects that Publindex has had on journals' publications in Colombia. Tensions were identified based on the literature review. After conducting focus groups and actor interviews, a tension profile was created for Colombian institutions, which may also be generalizable to universities worldwide.

Analysis of the existing literature and analysis of the empirical data collected during the interviews yielded two main categories of tensions which are not independent of one to another: Internationalization is the driver promoting the tension-generators that affect and promote the elements of Tension 2; therefore, finding a balance between both tensions, Tension 1 involves assessment factors, including internationalization, that drive incentive designs, and evaluation mechanisms. Tension 2 involves index journal effects, affecting epistemic community's and autonomy of research agendas.

Bearing in mind the conclusions presented above, regarding each university's institutional logic, governance, and its actors, the following frictions were identified as causes for the tension:

- For the PRUS, the main friction is between incentives and the autonomy of the research agenda. Researchers and editors frequently feel that managers and directors lack an understanding of the educational and scientific processes.
- For the PRUE, the primary friction is finding a balance between bonuses, evaluation criteria by discipline, and the needs of local epistemic communities' responses.
- For the PUH, the tensions fostered ethical misconduct concerning the pressure to publish or perish.

With these frictions in mind, we can now draw detailed conclusions for each tension.

## Tension 1

***Tension 1.1. Internationalization.*** Regarding this tension, efforts should be made to evaluate Latin American knowledge by recognizing regional bibliographic analysis systems. In addition, local bibliometrics must be created (at the national and institutional level), and inclusiveness should be promoted. Publindex's policy should make the invisible visible by promoting local bibliometrics and defining an inclusive model.



The pressure of Internationalization must be balanced through responsible research evaluation practices. Doing so could mitigate the current indicator's perverse effects on incentives for scientific production and, in turn, discourage epistemological biases and ethical misconduct and favour research autonomy.

***Tension 1.2. Incentives for scientific production in direct response to the Publindex policy.*** The focus on incentives should be redirected from productivity to career development, commendation for research, and research outcome. Incentives for each discipline and field should be defined to enable accounting for related research and publications' local, regional, and international contexts. Accountable metrics programs, responsible research assessments, and suitable research evaluation methods must be further emphasized.

***Tension 1.3. Evaluation mechanism and manipulation of indicators.*** The conservation heritage and intellectual property need to be addressed in the context of data management plans and information systems. New models to promote knowledge generation and dissemination should be based on journal articles and measurement models and include audiences of all types. For instance, stakeholders need to communicate research results to discuss the impact and foster mutual commitment for further development. Specialized repositories of preprints that offer new ways to present the research result in agile formats are a suitable halfway solution, generate alternative metrics as a new communication model and implement good practices from a responsible research evaluation mechanism to mitigate adverse effects.

## **Tension 2**

***Tension 2.1. Epistemic communities.*** Balancing the modes of knowledge production and the forms assessment is necessary to maintain the flow between local and international knowledge communities. Therefore, metrics should be developed according to the context, using different sources of support to balance each discipline's forms of communicating knowledge and the assessment criteria. In addition, depending on the regions and

discipline's needs and potentials, mature local scientific communities would benefit from interacting with international networks to sanction new products and exchange experiences in the way knowledge is produced.

***Tension 2.2. Autonomy in the research agenda.*** Since evaluation mechanisms link institutional policies and the research agenda of a university, developing institution-based evaluation systems could solve the challenges of research and knowledge production. At the same time, institutional policies should be developed to support regional knowledge dissemination and develop educational programs for scientific communication to engage a diversity of actors and, by using different communication channels, reach broader audiences.

***Tension 2.3 Ethical misconduct.*** The close connection between publication indicators and researcher salary levels leads to ethical issues. Therefore, there is an urgency to produce good practices in research evaluation mechanisms that respond to responsible metrics and scientific integrity guidelines. The advances made by frameworks like COPE (2017) can help promote integrity in scholarly research and its publication through policy guidelines and good practices. Moreover, using technologies to detect plagiarism, predatory journals, and other phenomena can be helpful. More than promoting ethical codes, incentives must go beyond the publication-based pay system and create mechanisms to assess the research results in terms of the impacts. Then, methodologies to measure and evaluate the research impact on social, economic, and environmental improvements need to be implemented (Orozco et al., 2007)

### **Final thoughts**

From an institutional perspective, performance measurement tools can be powerful instruments to understand an institution's historical achievements and profile. A key point to consider when measuring "quality" should be the relationship between research units and human resources to create academic and research career programs that align with organizational mission, values, and policies. When proposing indicators, these factors should be considered, complemented by other more qualitative approaches.

Rankings are sources of information and analysis used by most corporate indexes, such as Scopus (at the citation levels), QS, Times Higher Education, and Shanghai. Rankings offer a diverse pool of indicators that could provide information to improve institutional quality for the Colombian higher education system. These research indicators are central for determining university performance. However, there is a need for a methodological revision of the rankings. These indicators can be more useful if developed in a comprehensive framework from the research perspective.

Opening the black box of databases and indexes and starting to use multiple databases as sources of information to support and inform research, such as Google Scholar, Microsoft Academic, Dimensions, Lens, and Semantic Scholar, Red Alyc, Scielo, LA Referencia, RedCol, Scienti, Publindex in Colombia one would have to expand geographical and disciplinary coverage. For example, the U Sapiens Colombian Ranking has focused on postgraduate programs, research groups, and scientific journals without considering the best international practices in evaluation mechanisms.

Coordination between the Ministry of Science and Technology and the Ministry of Education regarding Colombian scientific production quality standards is urgently required, to find a balance between the learning process and models acquired in the last 20 years by the national system of Publindex, international standards, and new technological platforms. Coordinated governance between the information systems (Scienti, Publindex, RedCol, Kujane) must be created to generate interoperability and connect to international standards such as the persistent identifiers as ORCID or DOI and other models like OpenAIRE and the national Current Research Information System-CRIS- that are being developed in Nordic countries, Europe, the United States, and Peru, among others.

Generating data convergences and mechanisms for scientometric analyses is critical, for instance, using the regional repositories as LA REFERENCIA and Current Research Information Systems –CRIS- with open data platforms as DSPACE or VIVO, and persistent identifiers to harvest the data and develop a data management system for the region.

In this technological era, extensive multisourcing of data is possible through multi-model platforms and artificial intelligence. Experts in bibliometrics from Scopus, WoS, Dimensions, Crossref, and Microsoft Academic, have already taken advantage of these circumstances. Therefore, the research community in Colombia should engage such technologies, formats, and models to produce, disseminate, assess, and regulate knowledge production.

Large-scale digital data and emerging computational methods could allow us to refigure these positions, turning qualitative artifacts into quantitative patterns into qualitative insights across many scales, heralding a new era of theory development, engagement, and relevance for scientists, policymakers, and society. (Kang & Evans, 2020, p. 930)

Using these technological developments that allow scientometric analysis based on the region's fundamental corpus of knowledge would be an asset for local and international scientific developments. Furthermore, using the full potential of scientometrics in the institutional repositories would enable having a more systemic or complete view of science's behaviour and production to create incentive models that support the use of inclusive research evaluation.

To this end, a revision of Decree 1279 must be designed from a holistic perspective of responsible evaluation of research with deepened evaluation methods, including practices such as those suggested in DORA:

- Goal 1. Broadened definitions of what 'good looks like.
- Goal 2. Efficiency and effectiveness of the process.
- Goal 3. Flexible support and applicability across a range of disciplines.
- Goal 4. Credibility and transferability across system players.
- Goal 5. Increased faculty and research diversity.
- Goal 6. Confidence in actions and outcomes. (Hicks et al., 2015, n. p.)

These goals seek to provide a balance for evaluating the research in terms of tensions as quantitative vs. qualitative criteria and local vs. international. However, the risk of not changing decree 1279 would be to continue producing knowledge using the same incentives that hinder migration to other modes of knowledge production at the forefront of technology and, consequently, lead to ethical hazards and the imbalance in the appropriation of public funding of the Higher Education System in Colombia.

When looking at the list by institution, it is clear that the evaluation system, which is tied to the incentives scheme, is at the forefront of the expressed frictions that cause the tensions. Therefore, it is essential to consider an incentive model that includes qualitative and quantitative assessments from tacit and implicit incentives in terms of results as a conjunction of product, achievements, and effects in the impact of scientific and technological advancement. Responsible and contextual indicators play a vital role in modulating knowledge production and modulating research production with integrity and scientific ethics.

The main achievement of this dissertation is to show the tensions and misalignments in scientific publication practices and propose ways to develop a governance system that builds on a better coordination between the Minciencias and MEN. In doing so, an open space of participation to discuss and propose solutions to Decree 1279 of 2002 and the regulatory frame in the higher education and the science and innovation systems is needed. Proposals and tools to open this discussion can be found in this thesis.



## **8. POLICY RECOMMENDATIONS**

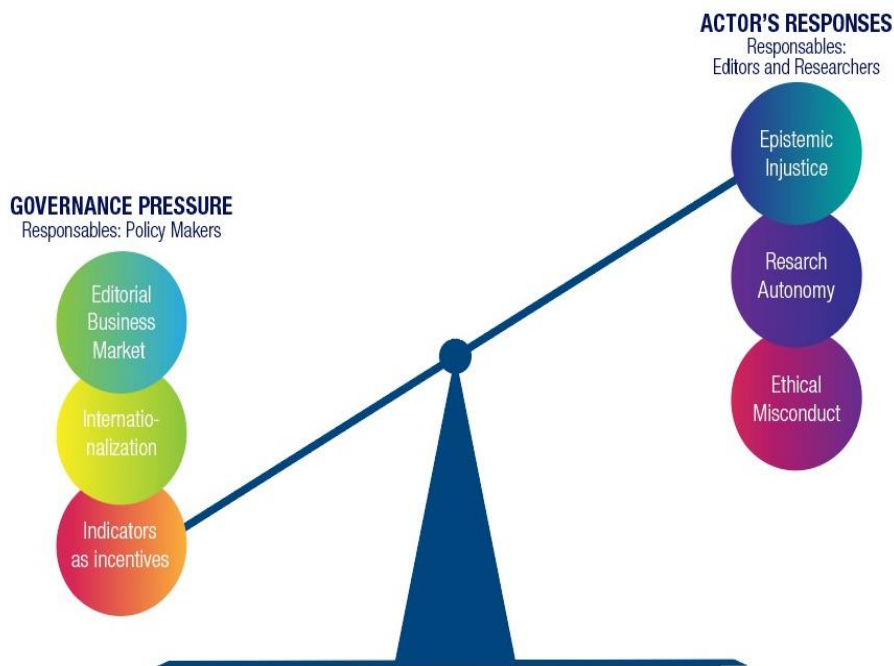
## 8. POLICY RECOMMENDATIONS

The following suggestions are meant as recommendations for policymakers and academic actors in Colombia and those interested in analyzing the national science system and its governance. These recommendations are made for designers of Publindex as a 'measurement tool'; for managers, decision makers, editors, researchers, and those concerned with the governance of research.

Developing a 'meta-governance' strategy is about "organizing the conditions of governance" (Jessop 2002, 242). To mitigate misalignment between policy instruments it is necessary to create coherence meta-governance between all types of actors in the system. For example, Publindex (2000), a policy instrument to categorize journals, has been linked to decree 1279 of 2002 to define salaries. This relationship has resulted in a proliferation of national journals and ethical misconduct by editors and researchers trying to foster career progression and salaries levels. To mitigate this, the Ministry of Science and Technology and Ministry of Education should coordinate an update of the incentive's program, review the goals of policy instruments (as journal assessment, research group assessment, accreditations) for evaluation mechanism to develop coherent coordination between different programs.

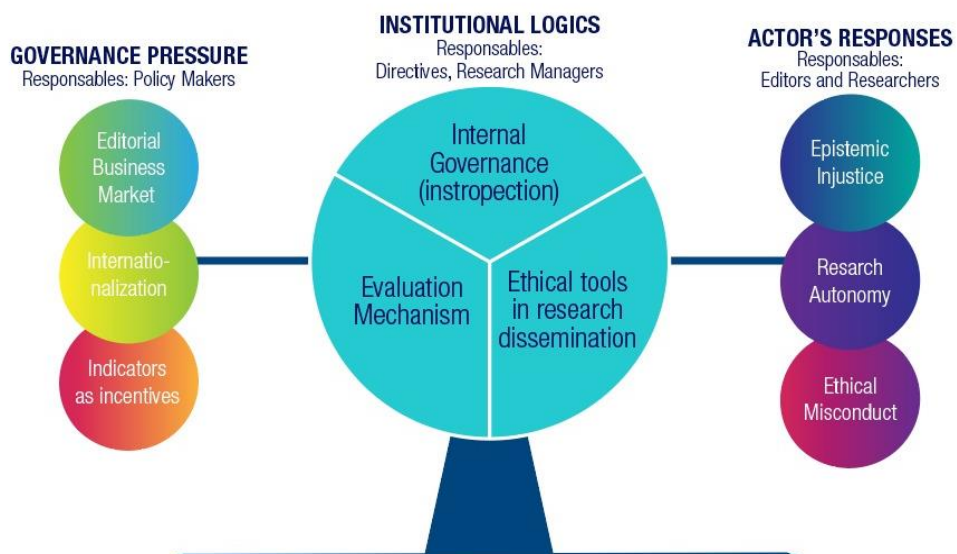
From a governance perspective, there is no balance between university research governance and the governance exerted by the Scientific Journal System Publindex, see figure N 46. External pressures generated by the scientific publishing market and the commodification of knowledge have generated an imbalance in producing and disseminating scientific knowledge. From indexation and categorization of scientific journals, Publindex's policymakers have given priority to internationalization processes through scientometric indicators in corporate databases that have become incentives for the production of knowledge in journals and researchers. This pressure has generated an imbalance within universities, mainly in responses given by editors and researchers where epistemic injustices, loss of autonomy in research, and ethical misconduct in research occur.

Figure N 46, Un-balancing University Research Governance, Scientific Journal System Publindex



To achieve a balance between the university governance, the Publindex Policy, external pressures, and actors' responses (see figure 47) it is necessary to work on three components of institutional change: governance, institutional logic, and actors' responsiveness. Work needs to be done at several levels:

Figure N 47, Balancing University Research Governance, Scientific Journal System Publindex





**For designers of Publindex, the following recommendations are offered:**

- Analyze the model of categorization of scientific journals that allows diversification of the typology of publications, including popular journals.
- Consider the criteria of responsible metrics in the construction of the indicators for measuring scientific production in the different instruments for measuring scientific production, such as Publindex and measurement of groups.
- Diversify the rubric of indicators for a scientific journal to consider disciplines' variety and local context.
- Develop models of institutional self-evaluation of the production of institutional scientific journals following institutional objectives and values.
- Publindex should be an information system that allows access and information from existing articles within the system.
- The Publindex system should build its bibliometric analysis, allowing for network analysis and consolidation of national epistemic communities.
- Develop evaluation mechanisms that have objectives in line with the context of the country and the challenges, allowing for evaluation and updating with specific time ranges.
- To have ethical instruments in disseminating research that mitigates misconduct in producing and disseminating knowledge.
- Beyond an instrument for journal measurement and categorization, the Publindex system should become a robust indexing information system as the semantic web that allows usability of information, for consultation of national scientific production by third parties, for the analysis of local metric indicators that allows understanding the actual state of the construction of networks to consolidate epistemic communities, and to legitimate local epistemic communities doing visible the local knowledge.
- Regarding its classification system, it is vital to develop the categorization with the diversification of information sources, i.e., multi-sources, using (WoS, Scopus, Microsoft Academic, Lens, Google Scholar, Red Alyc, Scielo, La Referencia, Publindex's internal system), understanding that scientific dissemination products can be diversified around new technologies, responding to different audiences.

- An alternative policy design to achieve a balance between valuing local and contextual development and internationalization processes should involve a viability study of keeping scientific journals according to an audience, sustainability, and journal typology.

Moreover, determining the consequences or impact of indicators as a starting point for incentives design in organizations or units of analysis will require evaluation tools that include the following characteristics:

- (i). Mission-oriented: The definition of the kind and number of institutional journals must align with the institution's mission, which allows the areas of knowledge that are strategic for the development of institutional research to gain relevance.
- (ii). Diversity: The ways of generating metrics of scientific production should allow multiple sources of analysis that make it possible to see the diversity of knowledge production and the consolidation of epistemic communities.
- (iii). Inclusion: The mechanisms for categorizing publications must include the forms of production and visibility of the different areas of knowledge.
- (iv). Responsible metric: The mechanisms for classifying publications should include the forms of production and the visibility of the different areas of knowledge.
- (v). Balance indicators weight: research evaluation indicators should be diversified to balance the modes of knowledge production.

At the meso level, organizations such as ASCUN and ASEUC have a significant role in legitimizing practices of good governance, promoting transformations that respond to internal and external demands. Accordingly, the following recommendations are given:

### For research managers and decision makers at the institutional level

It is necessary to regulate internal governance through a self-evaluation of the institutional logic that allows for constructing evaluation mechanisms in line with the mission and organizational values, academic careers, and ethical instruments in the dissemination of research that promotes the balance between autonomy in research and ethical conduct in the dissemination of knowledge.

The universities and publishers' associations are encouraged to introduce programs such as DORA, Metric Tide Responsible Metrics and research evaluation instrument as SCOPE from INORMS research manager network. All actors in the Higher Education system should be aware of the transparent use of indicators. To this end, it is essential to consider research portfolios, the development of academic careers, and adjusted research evaluation mechanisms.

In the interest of preserving local epistemic communities, institutions should develop a policy to understand institutional contexts, the unit of study, and its learning processes. In the case of Publindex, the following points should be considered.

### For editors

Editors are curators of knowledge in a specific area of knowledge. Therefore, it is essential to consider the leadership of editors in the consolidation of epistemic communities. To this end, the following is recommended:

- Building ethical guidelines for disseminating knowledge is one of the challenges to mitigate ethical misconduct.
- The use of metric indicators can go beyond traditional sources and use their bibliometric analysis to see the consolidation of academic communities.
- Legitimize and acknowledge the editorial career within the criteria for academic career development.

### For researchers

The development of the academic career is the responsibility of the researchers. They are supposed to successfully pursue the three key activities of higher education institutions: teaching, research, and service. For that reason, the academic career assessment should be covering all the missional activities.

In the future, these policy recommendations should be developed and implemented considering the tensions analyzed in this thesis. But, first, internationalization as a driver should be balanced with adequate diversification and the weighting of indicators that use research responsible evaluation mechanisms. This balance would result in higher levels of autonomy within epistemic communities and a more holistic method to evaluate research capacity.

These research evaluation mechanisms should include criteria of responsible metrics in terms of research evaluation methodologies, ethics in disseminating research, and structures that allow the development of academic careers. Achieving a balance between valuing local and contextual development and internationalization of research processes is essential.

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## **ANNEXES**

## Annexes

### Annex 1. International Rankings Research outputs

Table 25. International Rankings Research outputs

Times Higher Education
Citation impact (research influence). Internationalization research. International collaboration. Knowledge transfer.
Ranking Shangai
HiCi. The number of Highly Cited Researchers cited by Clarivate Analytics. N & S. The number of papers published in Nature and Science between 2012 and 2016. PUB. Total number of papers indexed in Science Citation Index - Expanded and Social Science Citation Index in 2016. Only publications of 'Article' type is considered.
QS Ranking
Indicators considered here include assessments of research quality among academics, productivity (i. e. numbers of papers published), citations (i. e. how recognized and referred to those papers are by other academics) and awards (e. g. Nobel Prizes or Field Medals).

<https://www.timeshighereducation.com/world-university-rankings/world-university-rankings-2021-methodology>

" Research (volume, income, and reputation): 30%, Citations (influence of research): 30%. We examine the influence of research by capturing the average number of times a university's published work is cited by academics worldwide. This year, our bibliometric data provider Elsevier examined more than 86 million citations from 13.6 million journal articles, article reviews, conference proceedings, books, and book chapters published over five years.

<http://www.shanghairanking.com/subject-survey/survey-methodology-2020.html>

A journal is considered to be a first-rate journal if 1. It has more than one vote on a topic. And 2. It has 50% or more votes on this topic or was selected in 2019.

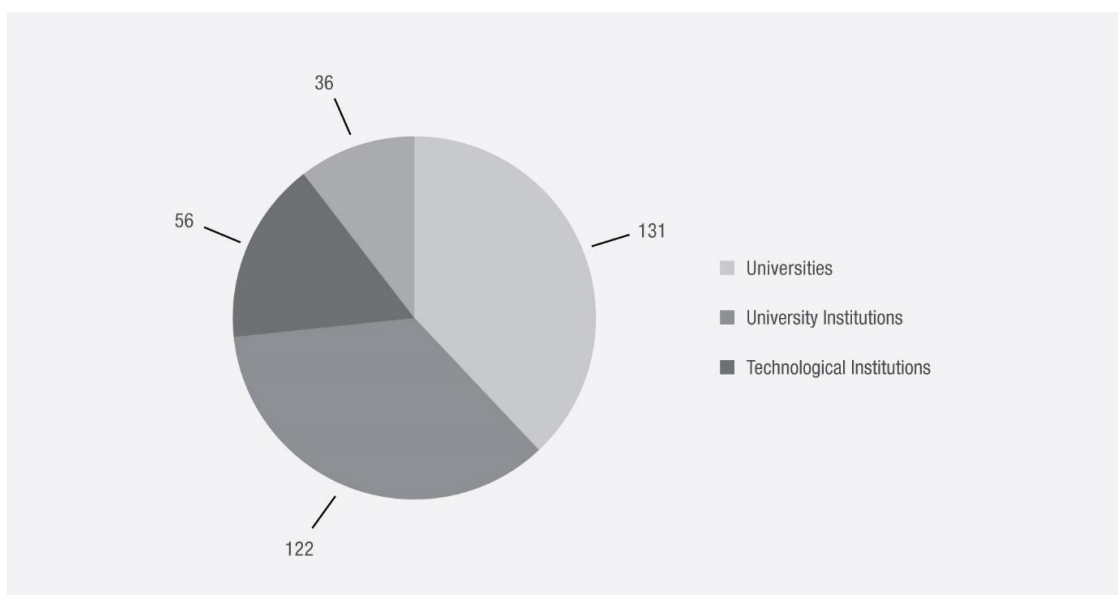
<https://www.topuniversities.com/qs-world-university-rankings/methodology>

Appointments by faculty (20%). "We used a five-year publication window for the papers, so for this edition, we looked at articles published from 2014 to 2018. All citation data is obtained using Elsevier's Scopus database, the world's largest academic journal data repository. This year, QS evaluated 81 million citations from 13.9 million articles once self-citations were excluded.

Annex 2, Contextual statistics Higher Education Colombia

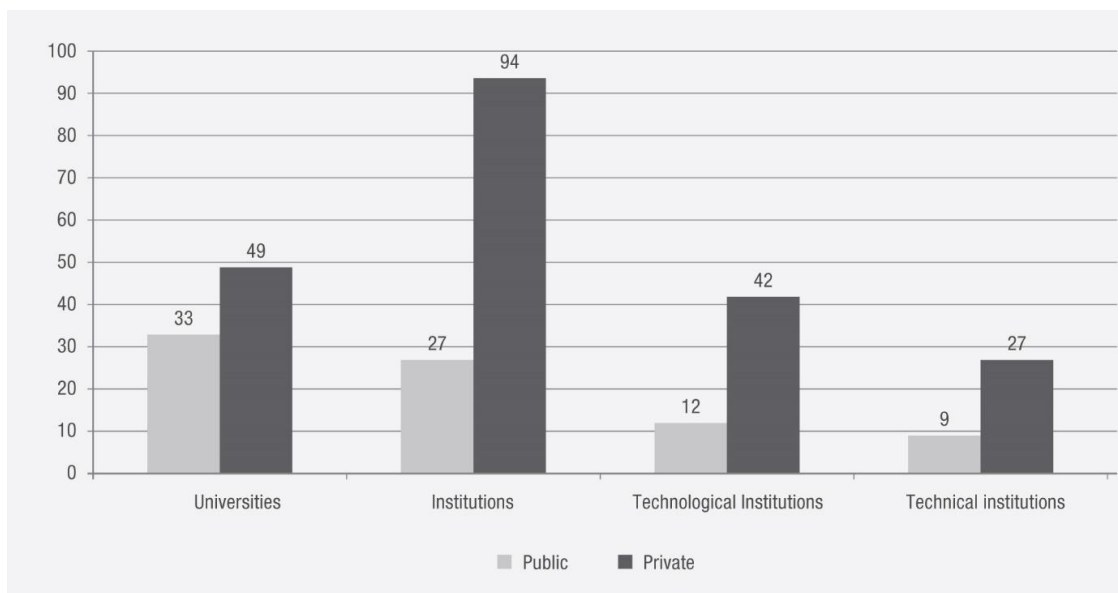
## Annex 2. Overview higher education institutions Colombia

Figure 48. Number of Higher Education Institution per typology



Source: Created by the author, Observatorio Colombiano Universitario.

Figure 49. Type of universities in Colombia



Source: Created by the author, Observatorio Colombiano Universitario.

## Annex 3. Journals Index in Publindex per institutions (1996 – 2014)

Table 26. Journal Index in Publindex per institutions (1996 – 2014)

Journals Index per Institution 1996 - 2014											
	1996	1998	2001	2002	2003	2004	2005	2006	2007	2008	2014
Universidad de Antioquia	5	4	13	11	14	14	16	15	15	13	30
Universidad Nacional de Colombia	9	9	31	15	19	22	28	28	39	39	47
Universidad de los Andes	1	3	11	3	4	5	5	5	5	6	11
Universidad del Valle	1	1	1	3	5	4	4	7	8	10	17
Pontificia Universidad Javeriana (Bogotá - Cali)	0	6	8	2	5	9	11	11	12	21	25
Universidad Industrial de Santander -UIS-	2	2	3	2	2	3	2	3	3	2	13
Universidad del Norte	0	1	5	1	0	1	1	1	1	4	11
Universidad Externado de Colombia	0	1	1	1	1	1	1	1	1	1	8
Universidad Pedagógica Nacional de Colombia	0	0	2	0	1	4	6	4	4	2	7
Universidad Colegio Mayor de Nuestra Señora del Rosario	0	0	2	1	2	2	3	3	4	5	5
Universidad Colegio Mayor de Cundinamarca	0	0	2	0	0	0	0	2	2	2	3
Universidad Distrital Francisco José de Caldas	0	0	4	2	3	4	4	4	3	3	14
Universidad Militar Nueva Granada	0	0	0	0	0	0	1	3	3	3	9
Universidad de la Sabana	0	0	1	0	0	0	1	2	4	4	7
Universidad del Cauca	0	0	1	0	0	0	1	2	2	2	2
Universidad de Medellín	0	0	0	0	0	1	2	2	2	2	4
Universidad Pedagógica y Tecnológica de Colombia (UPTC)	0	0	4	0	1	2	2	2	3	3	13
Universidad Autónoma de Bucaramanga	0	0	3	2	3	3	3	3	3	3	3
Universidad del Quindío	0	0	0	0	0	0	0	0	1	1	1
Universidad EAFIT	0	0	1	1	2	2	1	1	4	3	5
Universidad ICESI	0	0	1	1	1	1	2	2	2	2	3
Universidad Pontificia Bolivariana	0	0	1	0	0	1	1	1	1	1	11
Universidad Tecnológica de Pereira	0	0	2	1	2	2	2	2	2	2	3
Universidad Central	0	0	0	1	1	1	1	1	0	0	1
Universidad Antonio Nariño	0	0	0	1	1	1	1	1	0	0	2
Universidad Santo Tomás	0	0	0	1	1	1	0	3	3	4	20
Universidad Autónoma de Colombia	0	0	0	0	1	1	0	0	0	0	1
Universidad Católica de Colombia	0	0	0	0	1	1	1	1	1	3	3
Universidad de la Salle	0	0	0	0	1	2	2	2	4	2	10
Universidad Autónoma de Occidente	0	0	0	0	0	1	1	1	1	1	1
Universidad de Pamplona	0	0	0	0	0	1	2	2	2	2	5
Universidad de los Llanos	0	0	0	0	0	0	1	1	1	1	2
Universidad de Caldas	0	0	0	0	0	0	2	2	7	7	14
Universidad de Córdoba	0	0	0	0	0	0	2	2	1	1	2
Universidad Libre	0	0	0	0	0	0	1	1	0	0	12

Source: Created by the author, Minciencias

## Annex 4. Multilevel actors, stakeholder

Figure 50. Dynamics the Colombian scientific journal index and policy instrument Publindex, macro-level

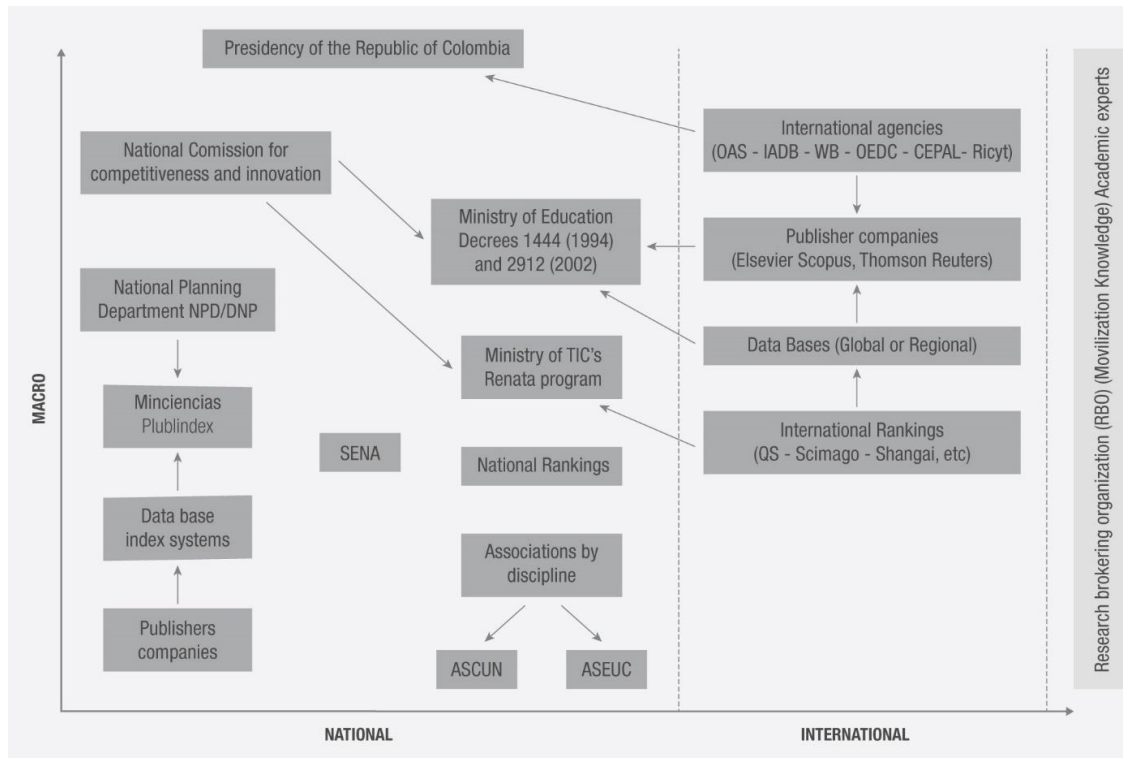


Figure 51. Dynamics the Colombian scientific journal index and policy instrument Publindex, Meso-level

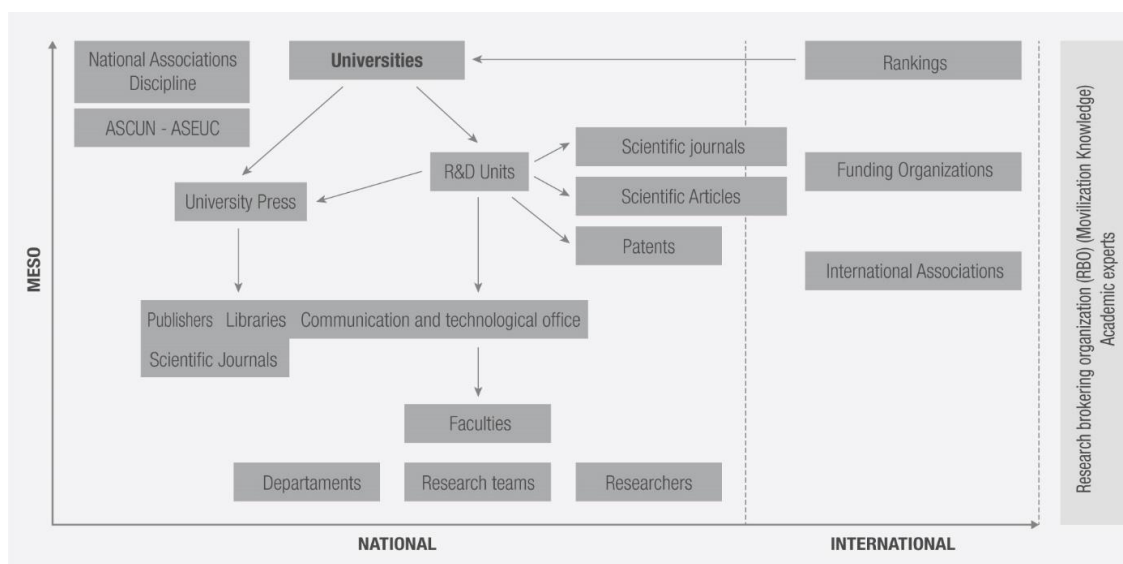
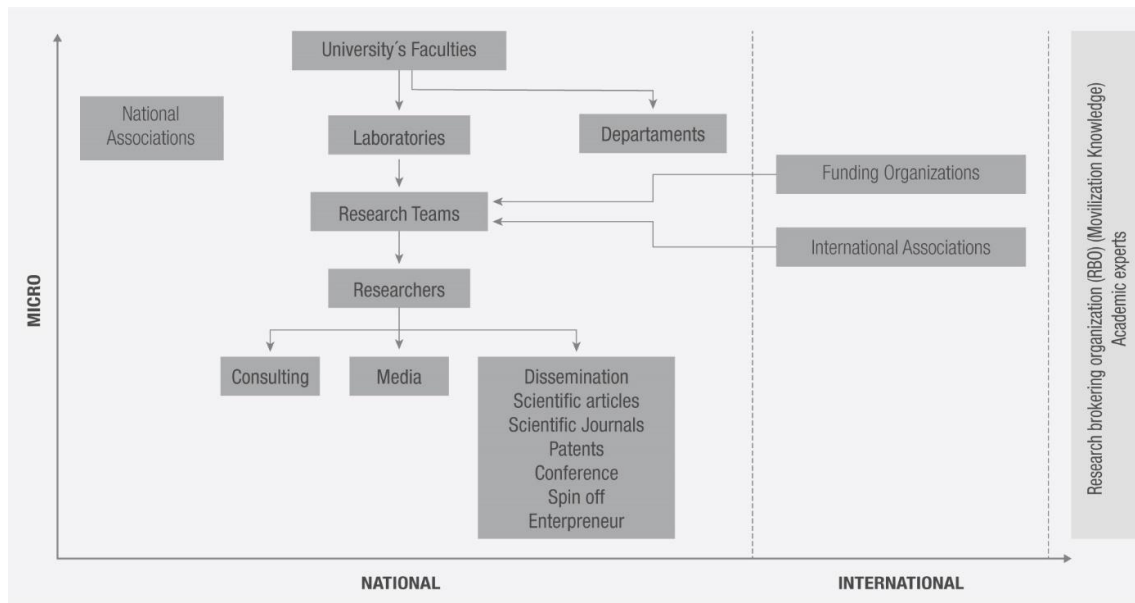


Figure 52. Dynamics the Colombian scientific journal index and policy instrument Publindex, micro-level



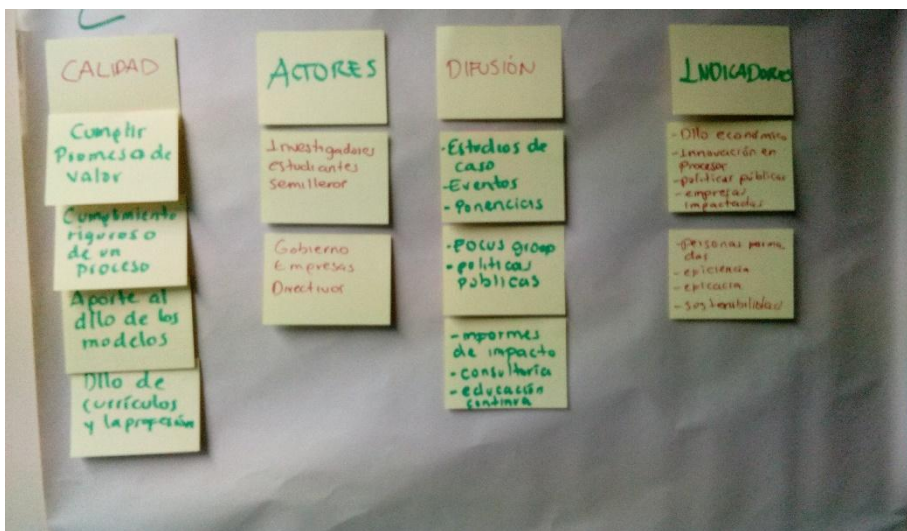


### Annex 5. List of events scientific journal policies and university research governance, fieldwork

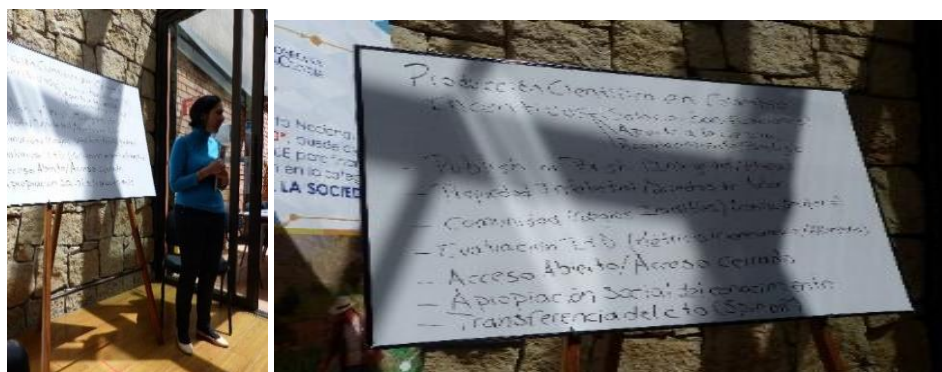
1. Foro el estado de la Ciencia en Colombia, mayo 26 de 2016, Lanzamiento nueva política de Revistas Científicas.  
[http://www.forsemana.com/evento/id/15309/foro\\_el\\_estado\\_de\\_la\\_ciencia\\_en\\_colombia](http://www.forsemana.com/evento/id/15309/foro_el_estado_de_la_ciencia_en_colombia)
2. II Seminario Internacional Gobierno Universitario, 29 de junio al 1 de julio de 2016, <http://www.uninorte.edu.co/web/telescopio>
3. Capacitación Pubindex Universidad del Magdalena, Santa Marta, agosto 5 de 2016.
4. Evento Asociación Colombiana para el Avance de la Ciencia ACAC, grupos de investigación se acomodan a los cambios de política tanto institucionales como nacionales, agosto 11 de 2016. <http://www.acac.org.co/>
5. Taller Revistas Científicas, Universidad Santo Tomas, agosto 23 de 2016.
6. IV encuentro de editores revistas científicas, 22 de septiembre 2016.
7. Conferencia Investigadores, Universidad del Magdalena, 27 de septiembre 2016.
8. Foro regional sobre revistas científicas: Políticas, Visibilidad y Acceso Abierto, Universidad ICESI, septiembre 29 y 30 de 2016.
9. Debate de ciencias sociales, mamados de Minciencias, octubre 17 de 2016, Pontificia Universidad Javeriana.
10. “Gestión Académica Y Gobernabilidad”, el Ministerio de Educación Nacional se permite invitarle a participar en el grupo focal, octubre 19 de 2016.
11. Reunión del MinEducación Gobernanza (focus groups) expertos en gobernanza, noviembre 17 y 18 de 2016.
12. Debate nacional de revistas académicas y científicas: contribución a la evaluación del modelo Pubindex de Minciencias, Universidad Nacional, noviembre 23 de 2016.
13. Invitación Proyecto SNIES, Ministerio de Educación, noviembre 23 de 2016.
14. Visibilidad y accesibilidad, ACAC enero 2017.

Annex 6. Focus Group pictures

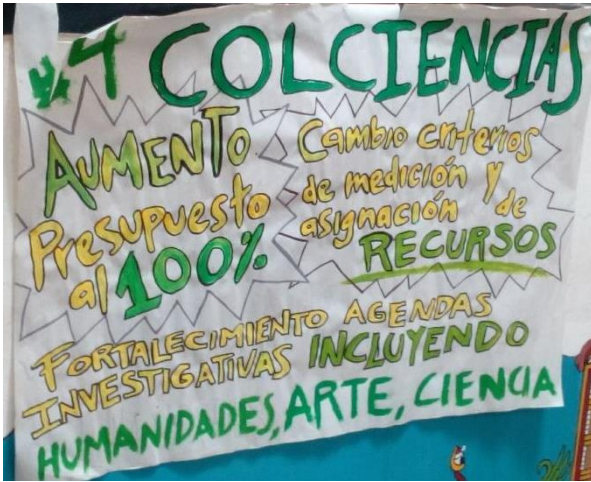
Figure 53. Map focus group Publindex



Source: Created by the author, focus group.



## Annex 7. Grafitti Public University

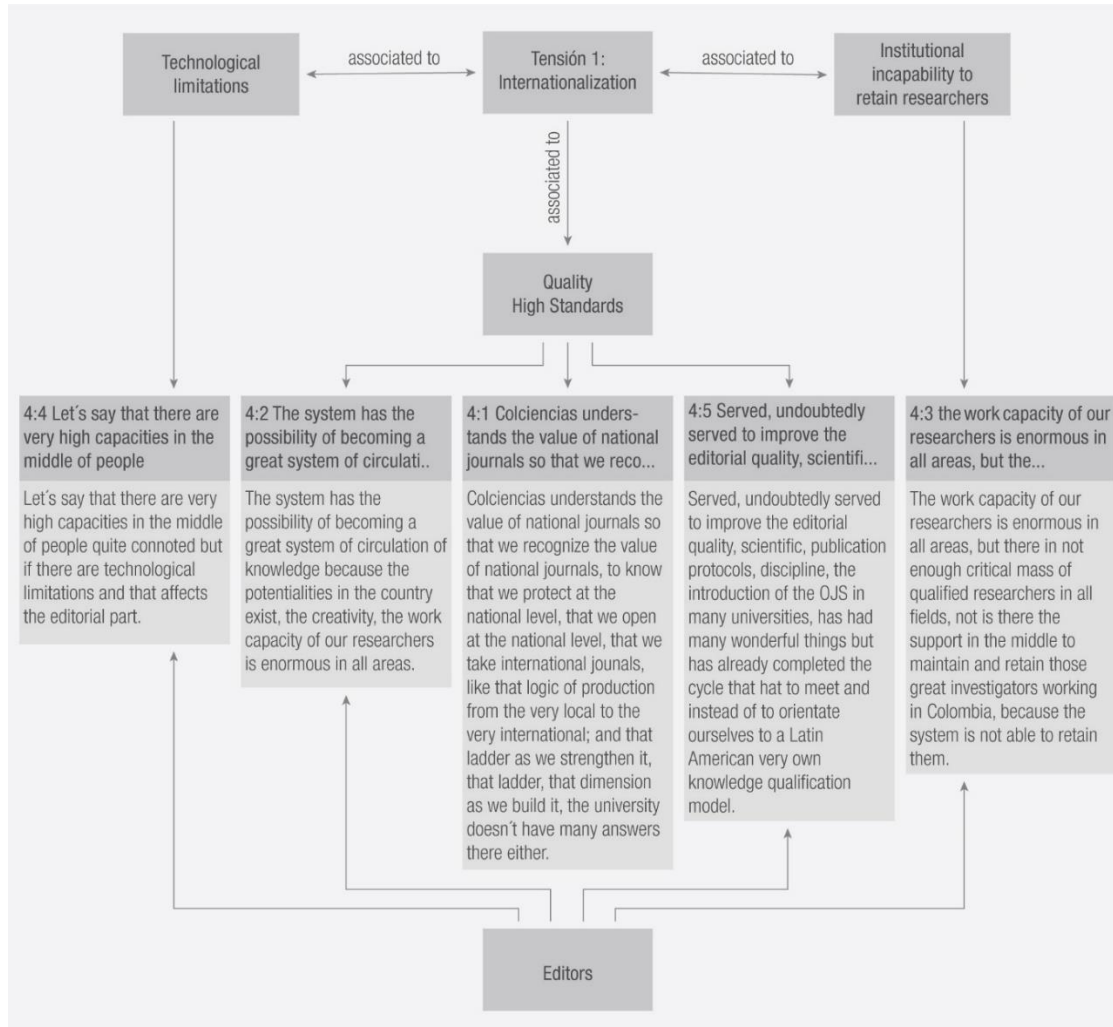


Source: photograph taken by the author in public University, Faculty of Sociology, 2018.



## Annex 9. Codification tension the Colombian scientific journal index and policy instrument Publindex Atlas.ti

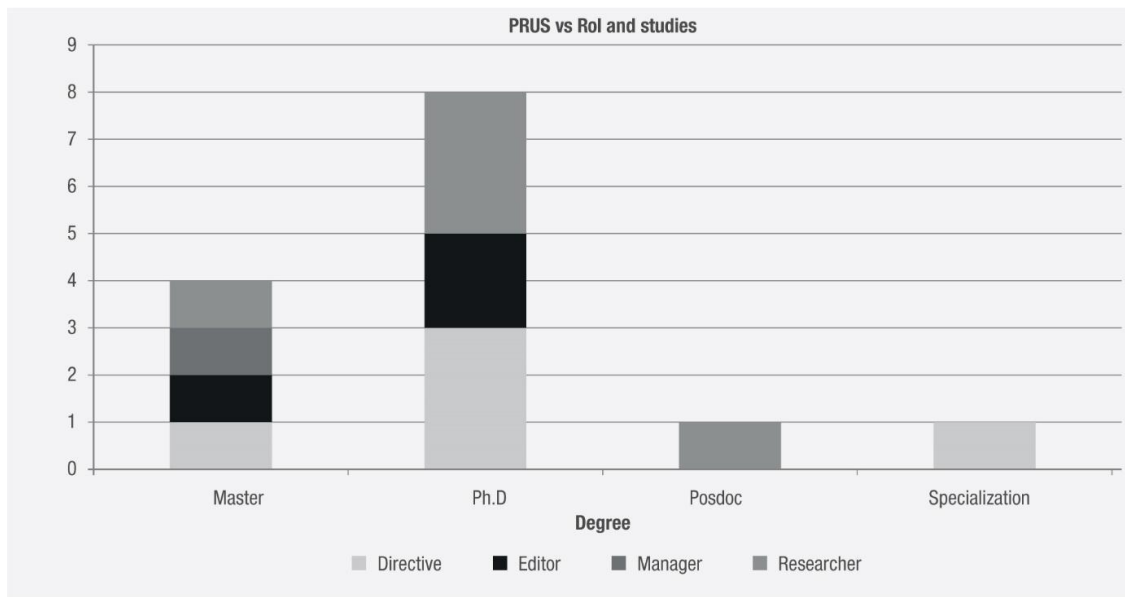
Figure 55. Codification tension the Colombian scientific journal index and policy instrument Publindex Atlas.ti



Source: Created by the author, Atlas.ti software.

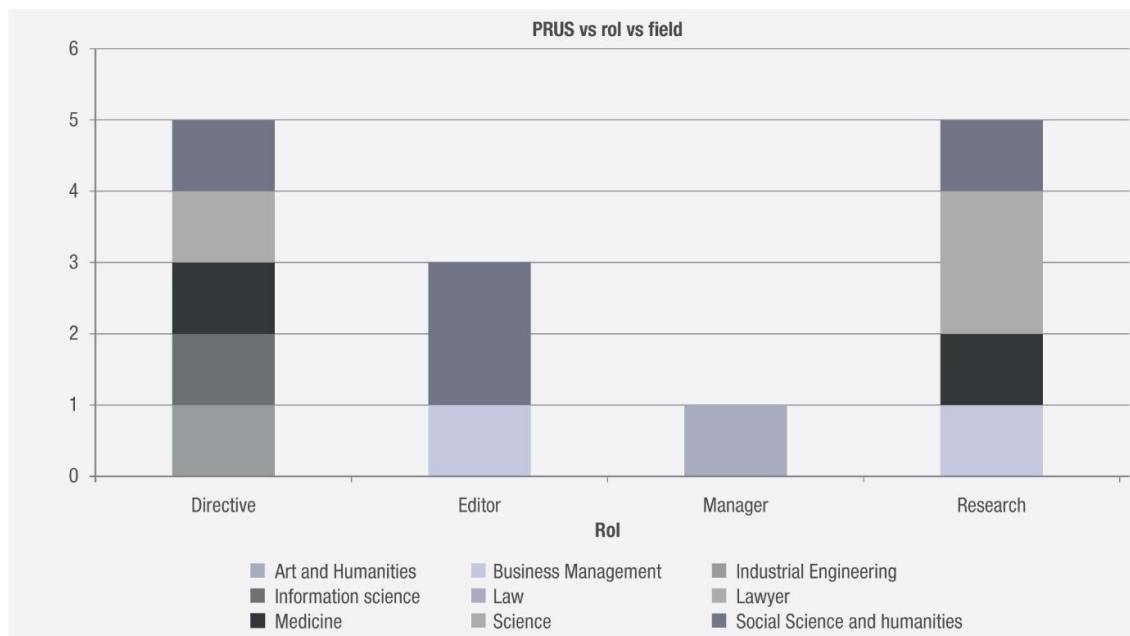
### Annex 10. Private University Social Mission (PRUS)

Figure 56. Actors Role and academic level PRUS



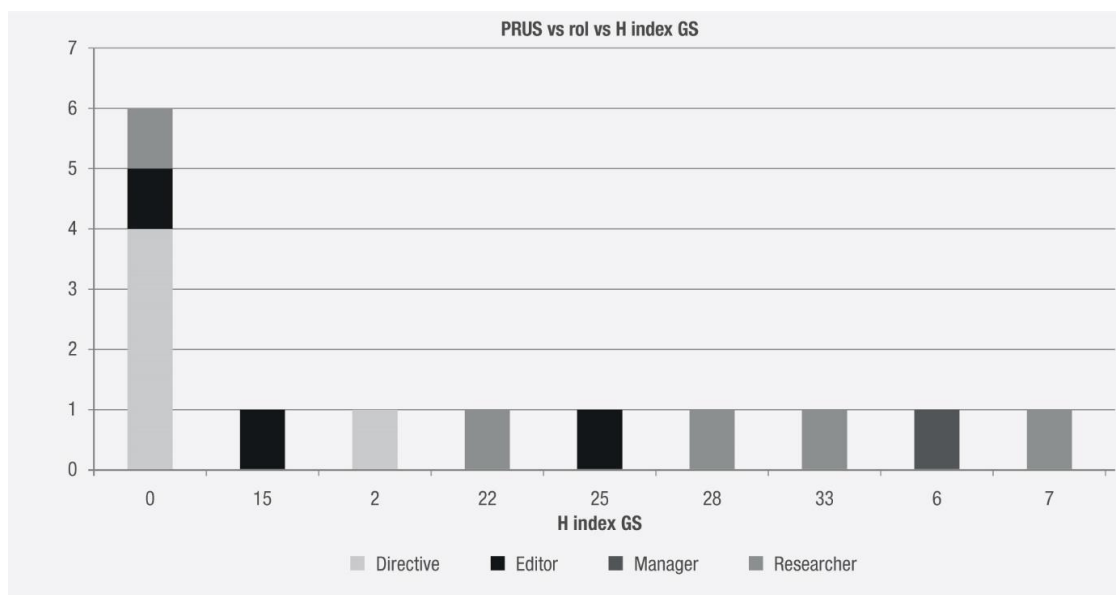
Source: Created by the author, Atlas.ti.

Figure 57. Actors role and field PRUS



Source: Created by the author, Atlas.ti.

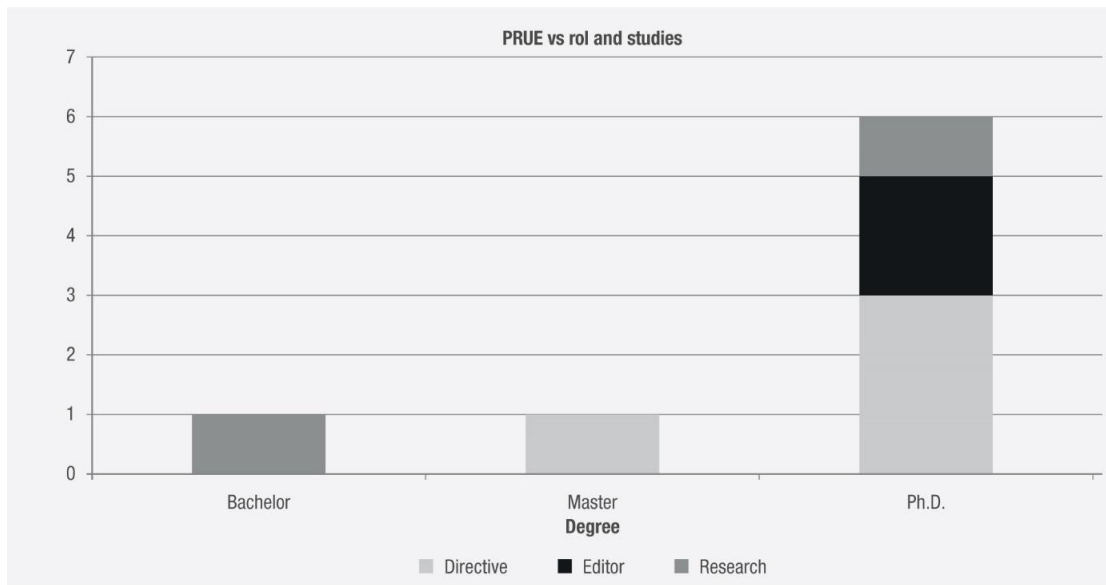
Figure 58. Actors Role and level of H Index Googles Scholar, PRUS



Source: Created by the author, Atlas.ti.

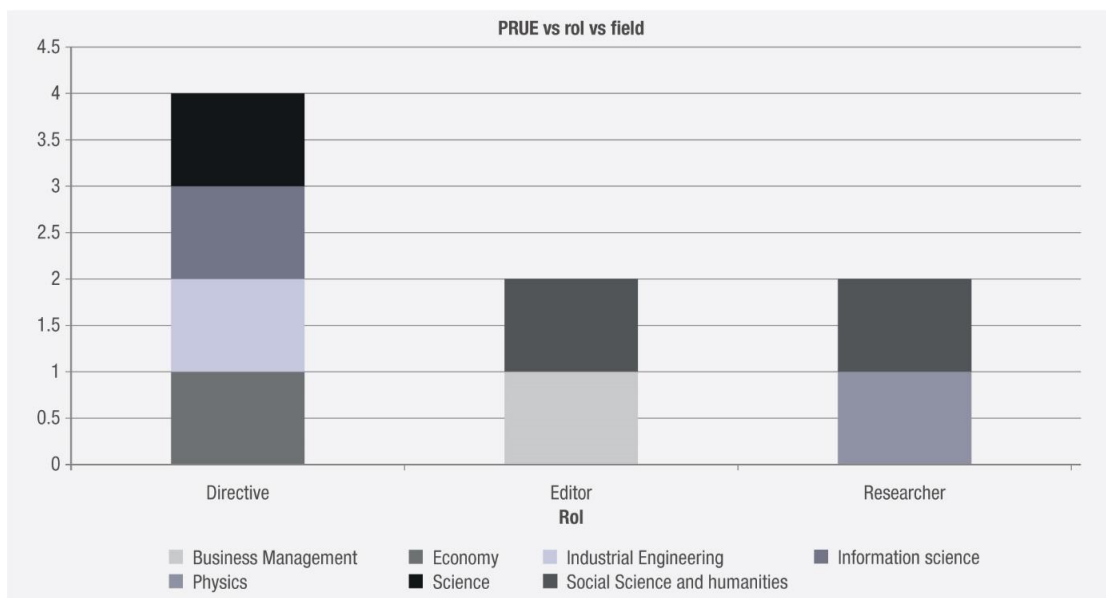
## Annex 11. Private University Excellence Mission (PRUE)

Figure 59, Actors Role and academic level PRUE



Source: Created by the author, Atlas.ti.

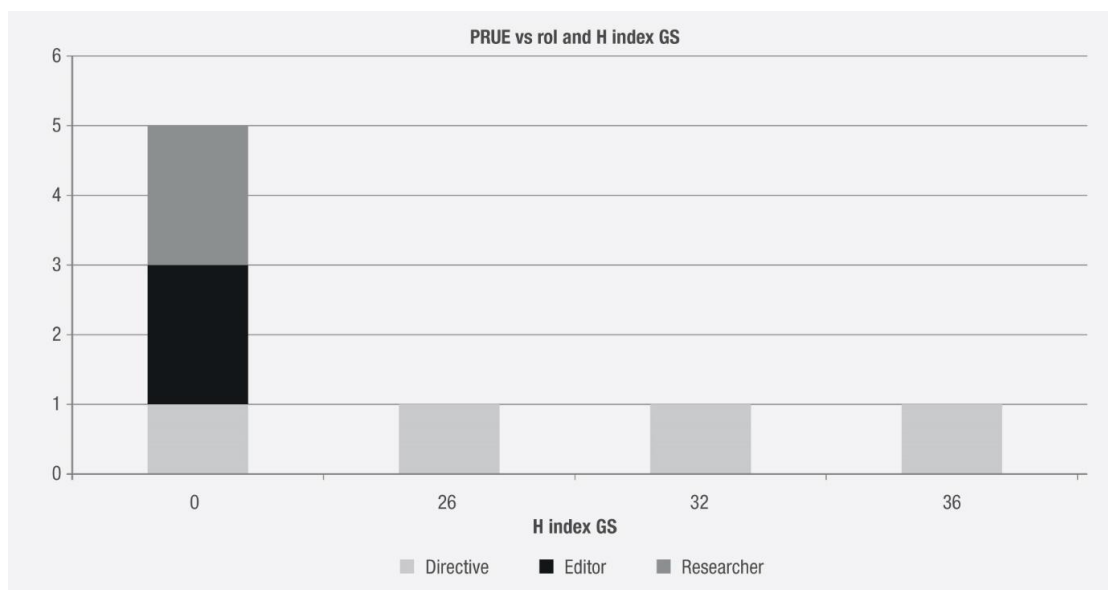
Figure 60. Actors role and field PRUE



Source: Created by the author, Atlas.ti.



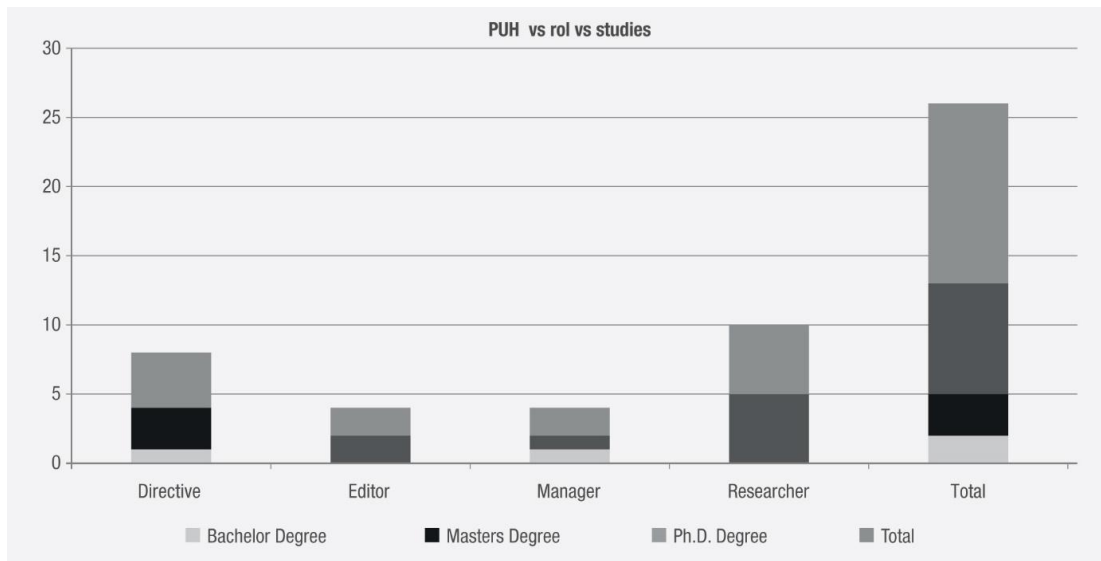
Figure 61. Actors Role and level of H Index Googles Scholar, PRUE



Source: Created by the author, Atlas.ti.

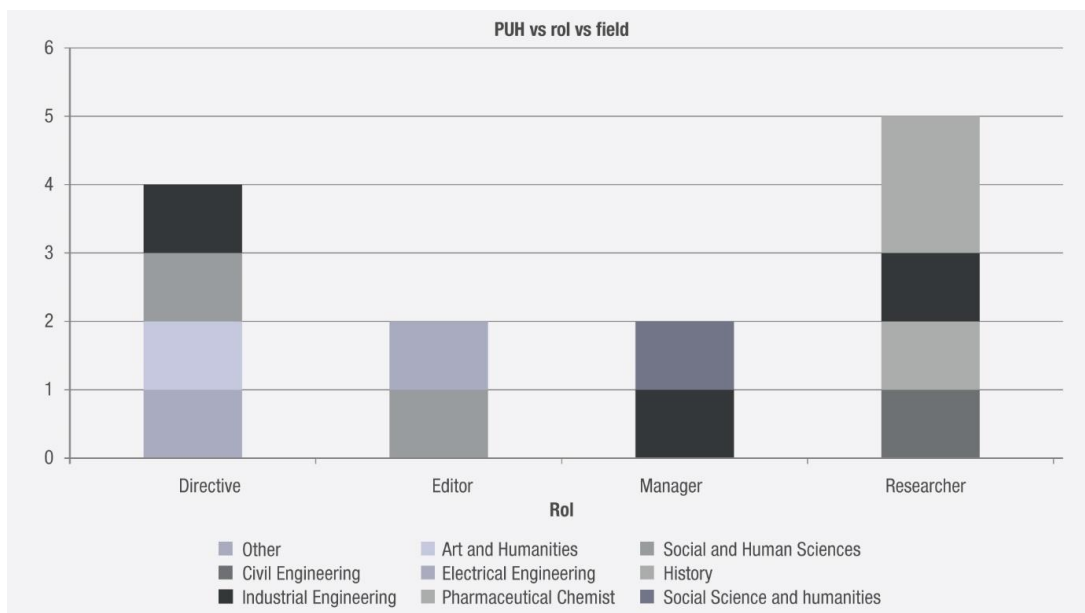
## Annex 12. Public university heritage mission (PUH)

Figure 62. Actors Role and academic level (PUH)



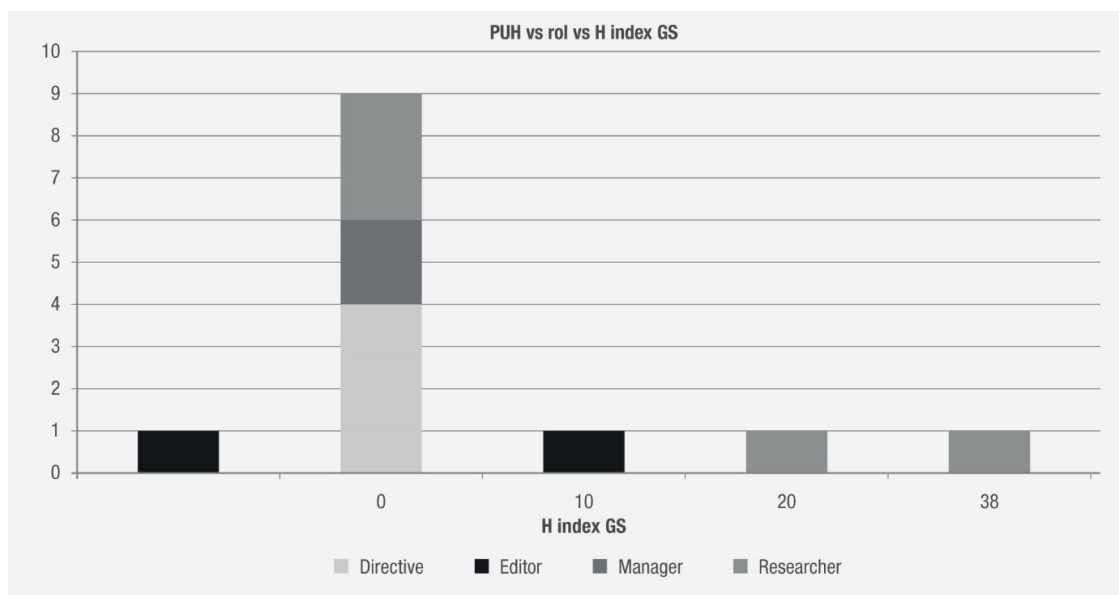
Source: Created by the author, Atlas.ti.

Figure 63. Actors role and field (PUH)



Source: Created by the author, Atlas.ti.

Figure 64. Actors Role and level of H Index Googles Schoolar, (PUH)



Source: Created by the author, Atlas.ti.

## Annex 13. Finding Analysis

### The pressures

The pressure of international forces exerted by OECD membership, database companies, international accreditations, rankings, and regional open access movements generate pressures and behaviour patterns from Colombian universities and research institutions. The central strains that produce the tensions are the pressures of national and international demands on university research governance (URG).

These pressures on governance, in turn, create problems in institutional policy, which affect the internal structure of regulatory elements such as (i) lines of authority, norms, and continually changing procedures, as well as formal and informal practices; (ii) currents, ambiguous policy, formal and informal ways, definitions of efficiency, cost overruns, and duplication of resources; (iii) every day tensions on intellectual property (copyright vs. open access), performance incentives of research in terms of wages vs. reputation (publish or perish), relevance / local vs. global, excellence, international positioning, definition model measuring institutional performance for multiple purposes, and defining appropriate scientific communication channels by discipline. (Table 27)

Table 27. Effects on internal university research governance.

<b>GOVERNANCE PROBLEMS</b>	Different demands (national and international) related with the Publindex	Lines of authority	Decision-making processes	Financing	Staffing
		Norms / procedures changes	Division of labour / power relations duplication	Priorities / strategies / procedures confuse.	Criteria used to reach hiring, tecnure and promotion decision recruitment criteria / incentives.
<b>GOVERNANCE POLICY PROBLEMS</b>	Policy discontinuity, ambiguity, lack of coordination.	Formal or informal practice. Deslegitimate actors.	Define efficiency, losing learning process.	Over income	Duplicate resources
<b>COMMON PROBLEMS OR TENSIONS</b>	International vs. local demands, losing research autonomy Evaluation mechanism. Incentives, Publish or Perish vs. salary (income); ethical misconduct.				

Summarize some of the points of view of the interviewers, the effects of this shift have been (i) erratic conception and implementation of policies; (ii) internationalization, rankings,

accreditation programs, influence of multilateral organizations; (iii) adaptation of models and policies that favor natural sciences and are generalized for all disciplines; (iv) institutionalism configuration, isomorphism; (v) incentives and performance, evaluation academic career development; (vi) culture of imperialism or capitalist intentions from databases such as WoS and Scopus, framing them as mafias; (vii) focus on indicators.

The main interrogations in the discussion on Publindex's policy What is the goal of Publindex policy? Visible to whom? Moreover, helpful to whom? (Figure 11). The interviewers show both sides of the situation; positive effects are considered a learning program, support visibility and internationalization, support evaluation, career development, and protect scientific heritage. From the perspective of adverse effects are the institutional configuration by asymmetric, propulsion volumes exceed the capacity of the system, dynamics of knowledge communities from different disciplines, isomorphic, copy models, erratic conception and implementation, waste resources, incentives performance in public universities (decree 1279), carousel of publication, overcome, sold research system to the multinational (mafia) cultural of imperialism. Theoretical concepts system of the circulation of knowledge and conceptualization of the politics of knowledge.

Figure 65. Publindex policy – Scientific production in Colombia

<b>What are the goals of the policy? Visible for whom? Useful for whom?</b>	
<b>Positive Effects</b>	<b>Negative Effects</b>
<ul style="list-style-type: none"> <li>- Learning program.</li> <li>- Internacionalization: Rankings, role of the multinational organizations as OECD.</li> <li>- Evaluations and assesment career development.</li> <li>- Inheritance / heritage.</li> </ul>	<ul style="list-style-type: none"> <li>- Institutional configurations by asymmetric.</li> <li>- Propulsion volumes exceed the capacity of the system.</li> <li>- Dynamics of Knowledge communities from different disciplines.</li> <li>- Isomorphic, copy models, erratic conception and implementation, waste of resources.</li> <li>- Incentives performance in public universities, decree 1279, Carrousel of publications, overcome. What is the financial policy of the resaerch?</li> <li>- Capitalism intentions, sold research system to the multinationals (mafia), cultural of the imperialism.</li> </ul>
<b>Theoretical concepts</b>	
<ul style="list-style-type: none"> <li>- System of the circulation of knowledge production.</li> <li>- Conceptualization of the politics of knowledge.</li> </ul>	

Source: Created by the author based on data analysis interviews.

This new international model's variables that involve measurements, excellence, prestige, incentives, performance, discipline, social contributions, and geographical relevance are the subjects of the discussions of each of the actors involved in the Colombian system of scientific journals. First, however, it was necessary to establish the actors and their roles to understand how they respond to their institution's logic.

### **Multi-level actor analysis**

At the macro level, the stakeholders considered in this study were policymakers, scientific associations, international experts, and macro rectors and boards. The meso level included the managers and researchers, and editors at the micro-level

Through a multilevel analysis, the objective was to analyze the types of actors in the combination of cultural-cognitive and normative elements, between the roles and functions in the formal and informal relationships concerning the demands of the internal and external scientific production of the following actors: L1 macro national Policymakers, international experts selected by the leaders in open access, regional and corporate databases, leaders of scientific associations; L2 institutional macro rectors, vice-rectors; L3 meso managers; L4 researchers; L5 scientific journal editors. Analysed actors from different angles (i) commercial or non-profit organization, (ii) copyright or open access, (iii) geographically (global, regional, local), and (iv) general or specialized database

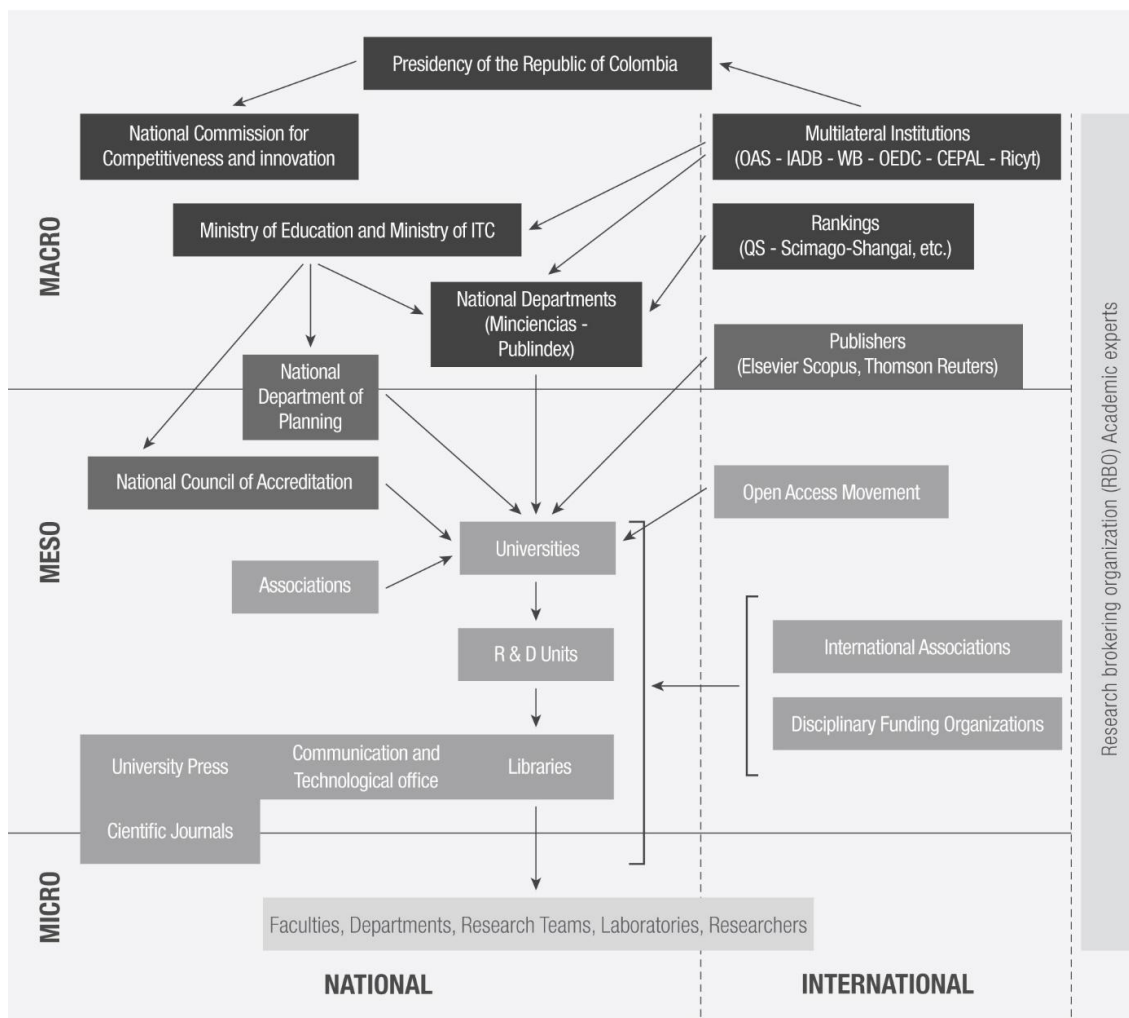
Publishers and corporations like Elsevier Scopus or Thomson Reuters/Clarivate Analytics with Web of Science are the main actors. These organizations' main instruments are scientometric measurements, citation programs (quartiles Q1, Q2, Q3, Q4), or specific indicators (H index, G index, IF). In the last decades, these organizations have strongly influenced policymakers in Minciencias to use these instruments as a model to evaluate research knowledge production in the science and technology system.

The first level is the macro level, which includes the public administration organizations that create the Colombian scientific journal index and policy instrument Publindex policies, incentives, or platforms. The second level is the meso level, which provides the association of research organizations (research centers and universities). The third is the micro level, including the research units, research groups, researchers, librarians, publishers, and

communication media units that create institutional policies to respond to the national policies. The last level includes cross-organizations, such as knowledge brokers or knowledge transfer consultants, and fundraising organizations that develop business intelligence or technological surveillance in specific fields, industries, or disciplines.

Locally, the main actors in the Colombian scientific journal index and policy instrument Publindex are the universities. The units engaged in the scientific journal policy Publindex are: the research or academic unit that regulate the specific incentives; the departments responsible for disseminating the knowledge, such as the university presses, editors, the libraries reliable from the index and sharing the institutional information in repositories; and the communication office with the function of dissemination and socializations knowledge; each faculty is accountable for curating the quality and peer review process in terms of disciplinary area of expertise.

Figure 66. Scientific Journal Index and Policy Instrument Publindex Actors



In level 1, the rectors and boards are responsible for defining the institutional policy, new research agendas, and strategies according to the institutional logic. At level 2, managers are accountable for the institutional arrangement to operationalize institutional scientific journal policy's financing and staffing process. At levels 3 and 4, researchers and editors respond and behave according to the specific governance structure's rules and schemas. (Table 28 and figure 65).

Table 28. Actors and Levels

LEVEL	ACTORS
Level 1 MACRO	Rector and board
Level 2 MESO	Managers
Level 3 MICRO	Researchers and editors

First, the external Governance stakeholders at the macro-level influence law and decrees, funding arrangement, and evaluation. From national arenas: National Accreditation Council proposes to promote the relevance of the following and social impact of higher education through the dissemination of knowledge in academically recognized media and the publication of scientific production, technical, artistic, humanistic, which has an indicator of existence and measurement in Publindex (Consejo Nacional de Acreditación, 2010). Policymaker interviewees “There is a lack of governance in the production of knowledge among the different actors in the system, such as the Ministry of Education, the Minciencias, which receive recommendations from experts and international organizations that are often inconsistent with each other. As policymakers, they must mediate with the decision-making instruments for the allocation of research resources”.

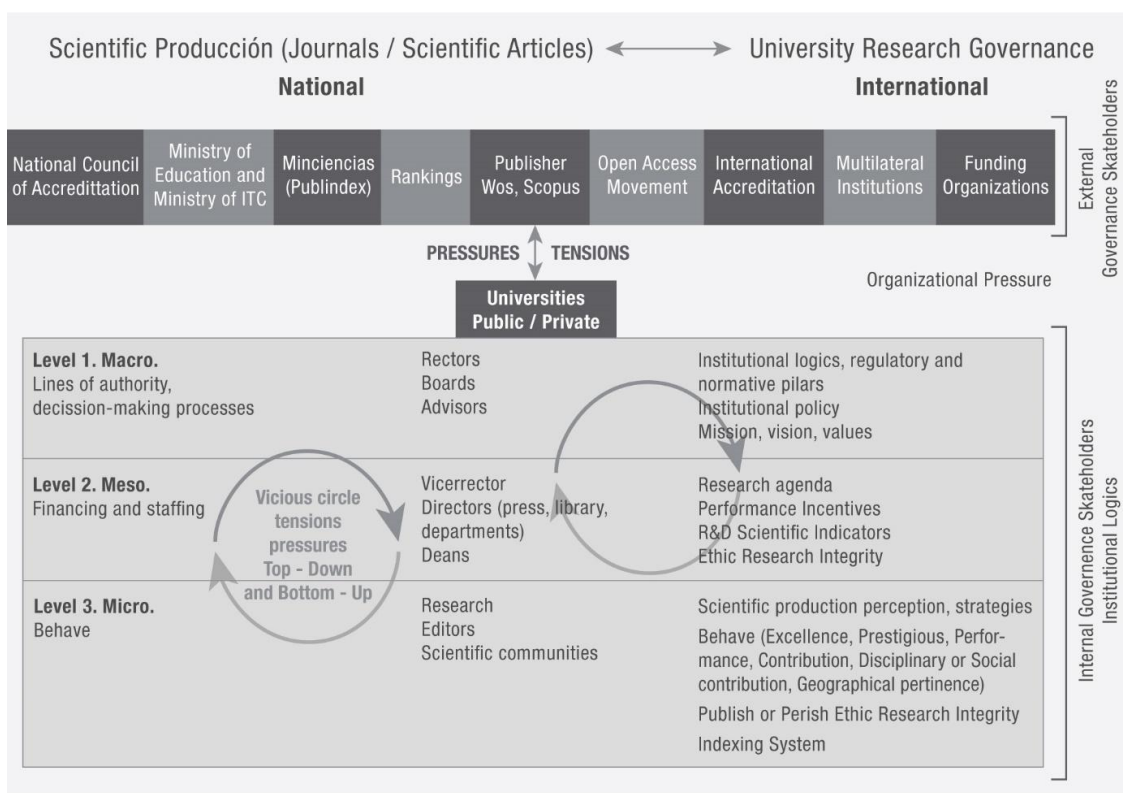
The meso level looks at the effects of the scientific system's policy and practice on university research journals' governance at the organizational level. In particular, the role of units involved in the system of scientific publishing, research or academic unit governing specific incentives for researchers, the departments responsible for the dissemination of knowledge



of university libraries responsible will be analyzed index and sharing corporate information repositories, office communication with the broadcast function and socialization of knowledge, and the peer review process in place to ensure the quality of research.

The micro-level looks at the effects of scientific, political journals and practice the system, both at national, international, and organizational researchers and editor's disciplinary behaviour in producing and disseminating knowledge in university research governance.

Figure 67. University research governance in the scientific journal Publindex policy in Colombia

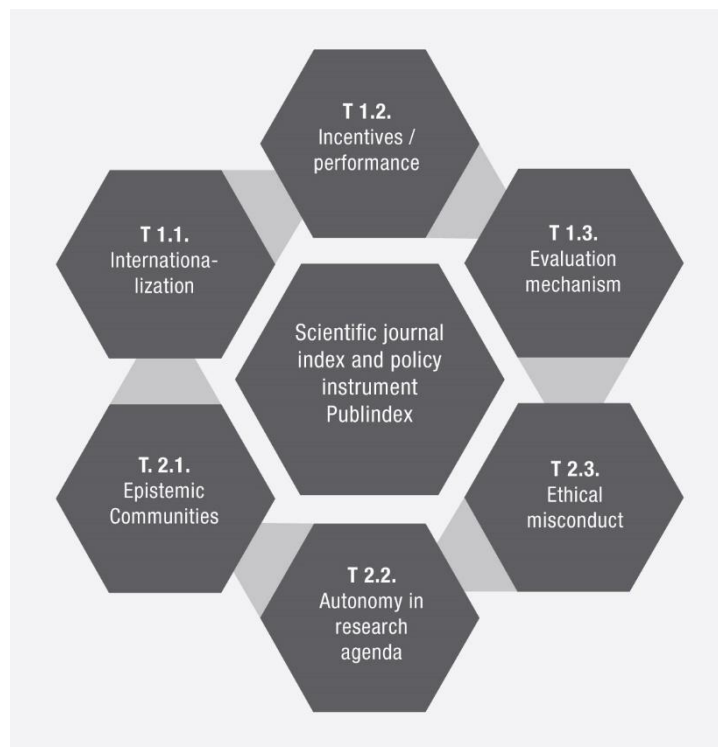


All of these actors in different levels play a role and function at the macro-level external governance policies for the other actor as national accreditation, internationalization programs from the ministry of education, evaluation and measures research from Minciencias, rankings, national and international publishers, international accreditation, multilateral organizations, funding organization.

## Tensions Scientific Journal Index and Policy Instrument Publindex

The following section explains the tensions that arise during the fieldwork of interview and research process data analysis regarding the scientific production in Colombia in academic journals, which influence universities' behaviour and actors by the logic of institutional governance. These tensions have been identified through the data analysis code (Saldaña, 2010), the results have been the statement interview protocol. All pressures created tensions that affected the Colombian scientific journal index and policy instrument Publindex (Figure 66); the following describes each tension.

Figure 68. Tensions scientific journal index and policy instrument Publindex



Source: Created by the author based on data analysis interviews.

## Tension 1. Assessment factors

### Tension 1.1 Internationalization. Scope and limitation of Publindex

#### Statement.

*The policy of Publindex has led to the Colombian publications being of low scientific quality, little visibility, and low international recognition*

The tensions are given by the strong influence of the corporations or scientific policy advisors allied to the multinationals in constructing the Publindex program called “the culture of imperialism and the sale of the research system.” The short-term effect is a loss of recognition of the Publindex program's skills, loss of heritage, asymmetric institutional configurations, isomorphism, and erratic copy of models with loss of resources. The theoretical conceptualization of knowledge policies and their circulation systems of knowledge production has been governed by the privatization and commodification of knowledge (Kauppinen, 2013) (p. 395)

The scientific production policy change in two realities first, policymakers and institutional policy vs. “real” publishing world in Colombia from researchers and disciplines. Specific actors in the scientific production system related to the legitimation of the Publindex program's positive or adverse effects.

The auto codification made by Nvivo journals is the primary driver of scientific production and research. The discussion is about a policy impact with national vs. international visibility and quality of it. Every actor in the system argues that policymakers are developing a system with effects and quality. For an international expert and consultant, what matters is the visibility of scientific production. For managers' scientific production impact, university directives are researchers impact, and researchers are quality and editors' journal impact.

Mercantilization and globalization of knowledge. In 2016, Publindex's national journal classification policy included quartile metrics based on WoS and Scopus criteria. This inclusion was justified, given that the national model has yielded low scientific quality and visibility and scant international recognition. There was a consensus in the interviewees' perception that this globalization process promotes the commodification of knowledge and isomorphism in the national context. In this context, the policy's scope and limitations were the interviewees, given its issues like the inability to retain researchers and technological constraints. The implementation of this policy raises other concerns in aspects such as quality vs. quantity standards. The previous raises questions concerning the policy's scope and to whom it is directed. Does it address international standards, disregarding national particularities? To the interviewees, aligning the policy's capacity to the national processes is key to determining the policy's scope, limitations, and challenges (Table 29).

**Table 29. Publindex policy – Scientific production in Colombia, problem tree analysis. Problem tree analysis**

<b>CAUSES</b>	Internationalization process, roles of multilateral organization influences OECD, WB, etc. Rankings, accreditations and data bases corporations. Copy model Isomorphisms. Erratic conceptualization implementations to adopt strategies and policies.
<b>PROBLEMS</b>	Institutional configuration by asymetrics. Oversupply propulsion of volume exceed the capacity of the system (Journal Mauslaughter). Overcome Carrusel publications. Special accents model tooks from basic science and not social science. Its measurements doesn't work for each.
<b>NEGATIVE EFFECTS</b>	Matthew and pyramid effect. Cultural of imperialism and capitalism. Sold research system to the multinational data bases. Become international scientific rigous loss local relevance and professional legitimation. The amount of national journals promotes pseudoresearchers and pseudoscience. Discourage interactions with other audiences and practitioners.
<b>POSITIVE EFFECTS</b>	Learning programs improve capacities in the scientific production, developed networks and communities. Put order to messy academic communication. Increase the standards of publication from pasquin to scientific. Heritage vs. inheritance. Quality vs. among metrics vs. among of social impact.
<b>SOLUTIONS</b>	Oriented ourselves to LATAM knowledge qualifications, recognize regional index systems. Time to make the own bibliometrics, open citations. Inclusiveness: Doing visible the invisible. Define new models of inclusion.

Source: Created by the author through the analysis of the interviews.

## Tension 1.2. Incentives performance

### Statement

*The policy of Publindex, in conjunction with decree 1279, has created a policy of incentives for research and scientific production of universities, where the researcher's priority is the salary increase was beyond contributing to science or solving local problems.*

Publindex's policy and Decree 1279 have been used to define the salary scale in public universities and have been used as a reference to describe the levels of scientific production, determining incentives to publish; private universities have followed this model for some years. These incentives to drive production have driven the notion that knowledge is improved by more excellent production, which has spawned other issues, such as the motivation to publish vs. interest and relevance, teaching vs. research, and endogamy vs. exogamy. Further problems arise when considering the viability of these incentives, which difficulty can hinder sustaining them, given public universities' high payroll. The salary relation motivates these extrinsic incentives; the challenge diversifies the incentives considering intrinsic and extrinsic motivations.

The governance structure of higher education institutions in Colombia depends on their configuration, public or private. Decree 1279 governs scientific production through the Publindex program in public universities. For several years some private universities have followed Decree 1279 with the freedom to adjust it to specific institutional needs. Unlike public universities, which must support the regulation with low capacity to modify it. For academic career development in the ranks, scientific production incentives tied to producing scholarly journals have been the most used by higher education institutions in Colombia.

The first problem has salary stratification because it is a model of publication that comes from the basic sciences. Researchers in this area are the best paid by the production capacity of the areas of knowledge. The second problem, mainly in public universities, has

been maintaining the same incentive for more than 19 years, generating perversion in the stimulus due to the high salary costs (Marsiske, 2017).

Public universities' institutional payroll takes approximately 70% of the institutional budget, much of it for 'puntimeter,' which means points for articles indexed in Publindex valued for perpetuity in the professional salary. Some academics are called predators of the institutions themselves with high wages per month.

For the private ones, the indicators have changed and depended more on the mission and institutional objectives. One of the most commonly used formats is specific bonuses for quartile articles in the discipline area representative. Later, the institutions' performance incentives to measure and evaluate the researchers will be described in more detail, analyzing the respective effects on academic performance management (Welpé et al., 2015).

The governance structure of higher education institutions in Colombia depends on their configuration, public or private. In the case of public universities, Decree 1279 governs scientific production through the Publindex program. For several years, some private universities have followed Decree 1279 with the freedom to adjust it to specific institutional needs, unlike public universities, which must support the regulation with low capacity to modify it. For academic career development in the ranks, scientific production incentives tied to producing scholarly journals have been most used by higher education institutions in Colombia.

The first problem has salaries stratification because it is a model of publication that comes from the basic sciences. Researchers in this area are the best paid by the production capacity of the areas of knowledge. The second problem, mainly in public universities, has maintained the same incentive for more than 18 years. It has generated perversion in the institutions' stimulus and financial sustainability due to the high salary costs that the universities have assumed. Currently, the institutional payroll of public universities takes approximately 70% of the institutional budget. The 'puntimeter' means points for articles indexed in Publindex are perpetuated in the professional salary. These can now be considered as they are by some academics as predators for the institutions themselves.

The indicators have changed and depend more on the mission and institutional objectives for the private ones. One of the most commonly used formats is specific bonuses for articles published in the respective knowledge area representative. The institutions' performance incentives to measure and evaluate are analyzing academic performance management (Welppe et al., 2015).

Behind the university's structures, governance is the functions and roles of academics that have been marked by teaching, research, and extension for the Colombian context. Models of incentives in higher education for academics have these three fundamental activities. In the case of public universities, Decree 1279 establishes academics' behavior in private universities. Autonomy is maintained to develop incentive models by the institutional governing bodies' priorities and decisions.

The data mining analysis made by Nvivo shows that incentives have been a strong influence in university research through scientific production in journals. Decree 1279 defined salary and professor behaviour. The researcher is the most affected by the incentives to represent their "modus Vivendi " through scientific production (Figure 67).

**Table 30. Perverse incentives, financial unsustainability, the emergence of predators, problem tree analysis.**

CONCEPT		DESCRIPTIONS / TENSIONS		
Incentives	Generate learning curve.	Culture of research and accreditation.	Higher standards of excellence.	
	Inducing behaviour.	Indicators and metrics.	Passion vs. salary.	Solve problem vs.salary.
The evaluation systems	Incentive system was producing distortion.	To change behaviours and avoid moral risk.	Accelerate the perverse evaluation.	
Logic of production of scientific knowledge	Usefulness, or its usability.			
Academic career development	Compensation, motivation. Classic theorist of the motivation.	Budget of the university that has been divided into operation and investment.	Adjust the model but the model does not necessarily implies incentives of the economic model.	

Source: Created by the author, bases on semi-structured interviews.

Table 31. Incentives, financial unsustainability, the emergence of predators, problem tree analysis.

<b>CAUSES</b>	Decree 1279, 2009, scientific production connect point salary (puntimeter) instrument to be promoted, failure not to change incentives in 18 years.
<b>PROBLEMS</b>	Unsustainability public universities, lax political interpretation at the manager level in public universities. Stratifications, highest salaries are in Basic Sciences and Engineering and the lowest salaries in Art, Humanities and Social Sciences.
<b>NEGATIVE EFFECTS</b>	Stimulus prevention, research, predators. Research behaviour, moral risk distortion.
<b>POSITIVE EFFECTS</b>	Research discourse has been internalized in most of the universities, generates culture of research accreditation. Encourage learning how to publish, researchers and academics aware of the importance of publishing.
<b>SOLUTIONS</b>	Inducing incentives more to career development not research productivity, think another mechanism to generate stadiums. The next step is, if there is a transfer, if there is international visibility, and with this three messages practically in a couple of years they can also be in the crossing of the incentive. Diversification products outputs in incentive policy per discipline, define local / regional / international context.

Source: Created by the author, based on semi-structured interviews.

The data mining analysis made by Nvivo shows that incentives have been a strong influence in university research through scientific production in journals. Decree 1279 defined salary and professor behaviour. The researcher is the most affected by the incentives to represent their “modus Vivendi ” through scientific production (Figure 67).

Figure 69. Incentives word cloud interviews



Source: Created by the author, Nvivo 11, bases on semi-structured interviews.



### Tension 1.3. Evaluation mechanism

#### Statement

*Citation-based evaluation mechanism policies are centred on databases where they are the border (tip of the iceberg), homogenizing the knowledge (always cited towards the top) but not the local knowledge developed by communities in developing countries with the black market of the business appointments behind it.*

The evaluation mechanisms of international scientific production have centered on using “tip of the iceberg” metrics of corporate databases in which knowledge is homogenized. As a result, those with the highest citations are on top, sometimes favouring volume and not quality. In contrast, local knowledge produced in developing countries is disregarded. The previous is further aggravated by the pejorative perception of "Grey Literature." The importance of reevaluating the measurement within a context is evident to support the development of specific scientific communities using new metrics and new assignment alternatives.

The mechanisms for evaluating Colombia's research have been marked by scientific production, mainly by the Publindex program. Its origins and for several years fulfilled a function of improving standards in scientific, academic output in the country, reducing exogamy.

However, the Publindex program's connection with the wage performance decree has perverted the system by generating inbreeding and malpractice in spurious indicators easily manipulated by the scientific communities, especially in public universities.

Colombia is transitioning from a purely local model to a model that includes international bibliometric indicators. The Publindex policy's main criticisms are excluding regional systems that lead to ignorance of local knowledge. The impact factor indicators in the

highest quartiles do not cover the scientific production developed in emerging countries. Therefore, the citations are not representative, ignoring contexts and disciplines. The solutions presented in international contexts are alternative metrics, open-access platforms, measuring other social and local impacts, complementary qualitative indicators, and usability.

The monopolization of quality through corporatization or imperialism of scientific production is mediated by objects such as databases. The citation-based measurement models and quartile-based indicators have affected the iceberg's tip, where only those at the top quartiles are seen and cited.

One of the leading causes is the generation of market practices where corporations, such as Elsevier, and Thomson Reuters, generate business model conditions for science. One of the requirements for indexing journals is that they are hot topics leading to losing their autonomy since they must search for fashionable issues cited for those at the top of the quartiles. Among the main effects is the lack of local coverage and particular discipline, dismissing other modes of knowledge and different circulation of knowledge, generating exclusion of the central discourse. Among the central questions to be visible to whom? The answer is the corporatization of research processes, developing a political and ethical vision of knowledge "where researchers must become Hollywood actors by number but not by content and relevance" Leader of the sucker from Minciencias, Facebook webpage.

Among the answers given by the scientific communities, the resistance effect of a group of academics in the social sciences area is well known. They created an online group called "sucker from Minciencias" on Facebook. In the leader's words, he calls it an expression of resistance to technocrats' arbitrariness of the institutions in charge of developing science and technology policies, which do not recognize Colombia's realities and context. He also affirms the disciplines are not policies that respond to international parameters that are not consistent with past policies but do not respond to the scientific communities' challenges and realities by areas of knowledge.

The second effect is the simplification of the research agenda in which, from a technical perspective, the criteria of disciplinary categories for the indexation of knowledge in Publindex are used, in terms of Knowledge organization System<sup>29</sup>, in terms of thesaurus and ontologies of language; Initially given by UNESCO's structure and now by the OECD categories, the citations work by each database's categories, which influences the number of citations and the impact factor according to each discipline's size.

The accountability models used by policymakers and managers are focused on meeting the requirements by numbers in the standardization processes given by the accreditations, rankings, and internationalization processes. Without considering the capabilities installed in the learning previously acquired in communities and organizations, eliminating processes and wasting organizational learning gave greater scientific and academic value beyond the standards.

Some consider the researchers' false dilemma of being on the frontier of knowledge by moving the border of experience or focusing on local issues. On the other hand, some define it as a global researcher focused on international discussions but losing the local context's perspective or having the capacity that specific local contexts can cooperate with international issues.

Another answer that is in search of propositive solutions is the reference to the importance of heritage conservation. Therefore, beyond the typical model through articles in journals and measurement models, the new proposals for the circulation of knowledge production are based on product diversification by audiences related to research that allows research results to be communicated to stakeholders, generating impact and mutual commitment for development.

For this reason, the mere fact of indexing different scientific communication products according to the research that engages stakeholders' response to scientific communities

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<sup>29</sup> Knowledge organization system KOS "can be described based on their structures (from flat to multidimensional) and main functions. The latter include eliminating ambiguity, controlling synonyms or equivalents, establishing explicit semantic relationships such as hierarchical and associative relationships, and presenting both relationships and properties of concepts in the knowledge models", (Zeng, 2008).

through discussion platforms such as specialized repositories with preprints, which generate altmetrics measurements, is a new communication model.

The mechanisms for evaluating Colombia's research have been marked by scientific production, mainly by the Publindex program. Its origins and for several years fulfilled the function of improving scientific and academic output in the country, reducing exogamy, and building local communities to international processes.

However, the Publindex program's connection with the wage performance decree has perverted: the scientific communities easily manipulate the system by generating inbreeding and malpractice in spurious indicators. We are currently transitioning from a purely local model to a model that includes international bibliometric indicators. The new policy's main criticisms are excluding regional systems that lead to ignorance of local knowledge. The highest quartiles' impact factor indicators do not cover the scientific production developed in emerging countries. Therefore, the citations are not representative and ignore different contexts and disciplines.

Some of the solutions presented in international contexts are alternative metrics, open-access platforms, measuring other kinds of social and local impact, complementary qualitative indicators, reliable indicators, and usability (Table 32).

Table 32. Evaluation mechanism

<b>CAUSES</b>	Quantitative indicators without taking on account quality, contexts and disciplines.
<b>PROBLEMS</b>	Evaluation Mechanism, expurios indicator easy to manipulate.
<b>NEGATIVE EFFECTS</b>	Exclusion of local and regional systems. Perverse system pushing to publish and quote tip of the iceberg.
<b>POSITIVE EFFECTS</b>	Standards measures to develop internationalization and colaboration.
<b>SOLUTIONS</b>	Measure another type of impact, open acces, altemetrics, social and local impact. Complementary qualitative indicators. Contextual and local indicators. Usability (information retrieval).

Source: Created by the author through the analysis of the interviews.

## Tension 2. Epistemic Communities, autonomy in research agenda, and ethical misconduct.

### Tension 2.1 Epistemic communities

Reputation building global vs. local knowledge. The construction of scientific communities deals with credibility to contribute to science in specific disciplines. Perhaps, the scientific policy has homogenized the communities, forgetting each discipline's specifics and the local context. Some interviewees believe that there is one science –most of these from natural science–. Social science researchers believe that scientific communities develop according to context, discipline, and language. This homogenization produces a mainstream community and not mainstream communities. Among the citation culture problems is the homogenization of thought under the control of measurement systems, generating a dependence on mainstream journals in constructing knowledge, thinking through the frameworks constructed by mainstream journals, and international associations of epistemic specialties.

Among the citation's problems, culture is the homogenization of thought under the control of measurement systems. Also, the generation of dependence on mainstream journals in constructing knowledge through the frameworks constructed by mainstream journals and international associations of epistemic specialties.

Some of the effects of this problem are recognition from the center, results found in the circles of diffusion of knowledge become relevant if published in English and the north. The center has a higher value than the periphery. The periphery knowledge is recognized in a derogatory way as grey literature. At the center are generated circles of power, prestige, and recognition.

The second effect is disciplinary dispersion. More and more specialties and sub-specialties due to power competencies and legitimacy egos do not generate constructive dialogues between large areas or disciplines. The disciplinary distribution becomes islands (isolation) within small departments, within the same micro-world faculty that cannot generate typical conversations.

The third effect is the loss of legitimacy before other audiences, mainly before the professionals. The scientific, academic world generates discourses and vocabularies so academic that it only communicates with peers but loses legitimacy before the professions' practices.

Some of the proposals continue to be linked with the conservation and healing of heritage produced in specific local contexts created in different formats. According to regions and disciplines, to empower new knowledge products and rely on the diaspora to set up mature local scientific communities can act as interlocutors with international networks. However, it is often the use of different concepts, theoretical frameworks, and methods. Some basic structures define the same concepts with other names or theoretical frameworks (Table 33).

Table 33. Epistemic communities, local vs. international construction

<b>CAUSES</b>	Global logics produce perverse logic and games (ISI culture) Big science vs. little science. From which way your frame?
<b>PROBLEMS</b>	Homogenization thinking framework. Measures control system. In maturity academic scientific communities.
<b>EFFECTS</b>	Become more relevant it is published in English and the north (center vs. periphery/mainstream vs. not mainstream) pejorative. Ego and jealousy research behavior - lack solidarity. Dependence system theory methods (Thinking through international associations and journals knowledge) Disperse disciplines (specialization phenomenon) Local Journal dispersion focus in accreditation indicator more than develop communities losing heterogeneous system and regional dialogues. Isolation competition: institutional islands, faculties, departments, and researchers isolation (play the own interest completion by indicators and funding). Lost legitimation with practitioners.
<b>SOLUTIONS</b>	Heritage Maintain (Conservation and curation). Thinking beyond the requirements to develop maturity. Countries provided knowledge they needed. Link international networks with regional problems. Encourage new knowledge productions according to regions and disciplines. New technologies allow the creation of new spaces, format, and model to produce, disseminate, measure and regulate knowledge production.

Source: Created by the author through the analysis of the interviews.

## Tension 2.2 Autonomy in the research agenda

### Statement

*Indexing systems such as WoS and Scopus, using the hot topic model, leading journals, and institutions to redefine research agendas that do not necessarily correspond to local problems and border knowledge for developed countries, losing autonomy in research agendas.*

The monopolization of quality through the corporatization of scientific production is mediated by objects such as databases. Citation-based measurement models and quartile-based indicators have generated an effect at the top of the iceberg where only those at the top of the top quartiles are seen and cited. One of the leading causes is the generation of market practices where corporations such as Elsevier and Thomson Reuters generate business model conditions for science. One of the requirements for indexing journals is that they are hot topics leading to losing their autonomy since they must search for fashionable issues cited for those at the top of the quartiles.

Identification of research agendas is a challenge. Corporate databases index using Hot Topics, which don't necessarily correspond to local problems but align with developed countries' issues, leading journals and institutions to redefine their research agendas, favoring measurement detriment of relevance. This demand generates a resistance mechanism and challenges knowledge management in finding ways to comply with the agendas given their institutional capacities. It also raises questions concerning public vs. private autonomy and publication vs. relevance and quality.

This tension necessitates two points of view. Some interviewees consider that there is only one science, and it is global. Who makes good science can have international discussions. A view of people who have a background in science. Some other interviewees consider that the databases and the rankings condition the talks to speeches that often come from the mainstream and are not pertinent to emerge countries.

Databases such as Wos and Scopus in the indexing processes of journals, one of the requirements requested, are hot topics, for these databases have a meaning of marketing in the sale of their products. Perhaps, for many journals, conditions covered and articles received to the journals gave less freedom to researchers and institutions in the research agendas. Some have called this phenomenon a geopolitical expression of knowledge, where databases shaped science into its market approach.

The problem identified lies in the loss of autonomy of institutions and researchers' research agendas and the monopolization of quality by the market practices of production. The north places the rules, and the south follows the patterns replicating experience without awareness of the context and its relevance.

Among the adverse effects is the lack of local knowledge or specific disciplines that are not mainstream discourse. For example, the article most cited in Colombia comes from the physics researcher engaging with the CERN institute (including the global research system). Additionally, an article from anthropology about the recruitment process and children's training by guerrillas in Colombia (excluded by index systems). Constitutional court documents, business or engineering case studies to apply in the industry, medicine research (oncology vs. geriatric, USA obesity vs. innutrition in Wayuu indigenous communities).

Another problem is simplifying the research agenda, perverse game—stratification disciplines of social science, humanities, and art. Specialization level killing disciplines. Decision-makers work around numbers by standards (accreditations, rankings, internationalization) without considering the specific installed capacity and resource for the country, institutions, research groups, and researchers.

Some solutions come from a research evaluation system, thinking of new model venues of knowledge production, new horizons, new audiences, achieving other circuits, and engaging other actors and channels of communication. For example, develop equivalence per disciplines and relevance; create a valuable national knowledge system for the context and reality; institutional policy supports other circuits of dissemination regional and local scope; develop a pedagogical program for scientific communication (Table 34).



Table 34. Autonomy in the research agenda, problem tree analysis.

<b>CAUSES</b>	Through data bases business model (hot topics) less freedom for researchers. How is science shaped? Different global, regional and local (expression of geopolitical knowledge).
<b>PROBLEMS</b>	Losing Autonomy Research Agenda. Market practices monopolize quality. Imperialism culture of knowledge production. North create the rules, south follows patterns, replicate knowledge losing problematization and knowledge.
<b>NEGATIVE EFFECTS</b>	Coverage top knowledge. Uncoverage local and punctual subject, underestimate other knowledge or other ways to circulate knowledge, exclusion of the central discourse. Visible for whom? For corporatization research process (political and ethical vision of knowledge). Hollywood researchers visible by numbers but not by content and relevance (universalism or egocentrism). Simplification research agenda - perverse game. Stratification of disciplines, weak construction of social science, humanities and art. Especialization level killing disciplines. Measures accountability instrument for policy makers and managers, decisionmakers work around numbers by standards (accreditations, rankings, internationalization) without taking into account the specific installed capacity and resources for the country, institution, research groups and researchers.
<b>POSITIVE EFFECTS</b>	Research resistance as social sciences, humanities and arts (Colciencias suckers FB group) express the arbitrariness and authoritarianism of technocracy, bureaucrats of science and technology.
<b>SOLUTIONS</b>	Disassociation Heritage conservation without taking into account the history of epistemic communities at local level. Evaluation system thinking new model venues of knowledge production, new horizons, new audiences. Creation of national knowledge, useful and concrete for the context and reality. Institutional policy support the circuits of dissemination in regional and local scope. Pedagogical process of scientific communication to learn the game, achieve other circuits and engage other actors and channels of communication. Making equivalence per disciplines, make room for relevance and different audiences.

Source: Created by the author through the analysis of the interviews.

### Tension 2.3 Ethical misconduct (Publish or perish).

#### Statement

*The eagerness to publish or perish has led to the researchers' behaviour to publish with low-quality levels rife with ethical problems—examples of which include recycling, hazing, salami-slicing, or predators.*

The premise of publishing or perish has driven behaviour that lowers the editorial quality of publications and engenders ethical misconduct; one of the mentioned reiterative issues is the low accountability to peer reviewers to ensure knowledge quality. The interviewees mentioned other problems affecting the quality of editorial and scientific conditions, such as

the exercise of predatory behaviour. The repurchase of their knowledge in different contexts, “recycling,” is one of the most prevalent actions along with recycling and salami slicing.

The traditional phrase is published or perished in Colombian contexts where production has been linked to the salary scale has generated pathological behaviour; some interviewers consider it the cancer of knowledge production. This practice has been called literary recycling production because of the desire to publish the same document or sections in different formats, languages, or journals. The editors identify this practice as one of the most common, especially in Brazil. Researchers in this country publish the same articles published in Portuguese, then in English and Spanish in different journals and receive salary points. For this reason, Colombian publishers have been cautiously handling the receipt of manuscripts from Brazilian researchers. In international, authors have studied the phenomenon (Horbach & Halffman, 2017).

Some of the adverse effects have been manipulating researchers' measurement indicators, such as the H index. The challenges faced by ethical issues are linked to new technological platforms that demand new measurement models.

Within the discussions, two-division prevail. The first is related to research ethics, and the second is to publication ethics. However, since both are part of the production cycle, research and knowledge are connected. Some procedures and actors change for each stage, but most interviewees agree on the importance of generating an ethical culture based on declarations or principles that allow developing scientific integrity.

Pathological behaviour or cancer dominates in the scientific production phenomena in recycling, salami slicing, or plagiarism. It is the force from performance indicators behind salary as *modus vivendi*. The adverse effects are predatory patterns from institutions, researchers, and editors; positive impacts disseminate knowledge and peer review systems that improve quality. The option to enhance is to use new technologies to avoid plagiarisms and other pathological behaviour.

The practice of recycling is particularly evident in the contexts of such Brazilian researchers. Researchers in this country publish the same articles in Portuguese, English, Spanish, and different journals. As a result, those researchers receive salary points for it. For this reason, Colombian publishers have been cautiously handling the receipt of manuscripts from Brazilian researchers. These pressures are explained by Campbell's law (Campbell, 2010): "The more any quantitative social indicator (or even some qualitative indicator) is used for social decision-making, the more it will be subject to corruption pressures and the more prone it will be to distorting and corrupting the social processes it is intended to monitor."

Some of the adverse effects have been manipulating researchers' measurement indicators, such as the H index. Several researchers have mentioned the unethical use of researchers in Google Scholar due to the lack of standardization. The system takes information from people with the same name. It appropriates it to a different researcher, the automation of the profiles generates homonyms which, if not normalized, build inflated indicators and do not correspond to the author's information. Several researchers, especially in primary and health sciences, have citation attributions that do not correspond to them without further refining their google scholar profiles. All of this invariably increases the H index of a specific scientific community.

International databases have high evaluation standards, with scientific committees specialized in knowledge areas as a positive effect. That specializes in selecting high-level international peer evaluators, which allows them to improve the means of scientific production published in these circles and generate greater visibility in other processes.

The challenges faced by ethical issues are linked to the new technological platforms that demand new measurement models. Unlike traditional ones, such as specialized repositories and preprints, other circuits of knowledge circulation have generated new processes that still do not have clear regulations and limits regarding intellectual property.

One of the main problems is the direct relation of salary scales and the evaluation of academic activities that improve intellectual effort with a living wage that allows the generation of recognition results before individual scientific communities and the

institutions' specific requirements. They are called the adaptive responses to the evaluation pressures that enable survival in the system and generate a way of life. In some cases, they may frame themselves within a relationship of academic ethical culture and discipline in which trust, transparency, and reputation are the primary basis.

**Authorship.** Defining the authors and order of a publication is still a free subject in some organizations and disciplines, depending on who yields the power, editorial contacts, or prestige in an area of knowledge. The authorship themes can come from who wrote what, who led the project, the student's role, and the prestige pieces. Some academics used undergraduate or graduate student work in the past decade and turned it into Colombia's work.

**Fraud invented data.** In the Colombian system, the data to evaluate the research group is denominated Scienti; one of the ex-directors of knowledge management in Minciencias analysed the system's data index. Policy Maker Minciencias “The editors and groups the information, the groups of lies, lies the researchers were telling, lies sure manually you know that report 600.000 invented data.” See Table 19 and 20.

**Table 35. Ethical misconduct (Publish or perish). Problem tree**

<b>CAUSES</b>	Performance indicators linked by salary point (performance).
<b>PROBLEMS</b>	Behavioural pathologies others consider that these ethical dilemmas are cancer in the production of knowledge. Risks moral, political and editorial.,
<b>NEGATIVE EFFECTS</b>	Evaluation tools, manipulation of indicators. Predatory journals, researchers and institutions. Fraud.
<b>POSITIVE EFFECTS</b>	Dissemination and visibility. Peer reviews and exogamic. Intellectual property (Creative commons) / Copyright.
<b>SOLUTIONS</b>	New technologies of communication more cooperative models as preprints or post peer review models.

Source: Created by the author, based on semi-structured interviews.

Table 36. Ethical misconduct (Publish or perish). Conceptual map

CONCEPT	DESCRIPTIONS / TENSIONS
<b>GENERAL</b>	Quality, recognition, valuable knowledge. Anti-manipulation vs. manipulation indicators and evaluation tools. New technologies of communication more cooperatives model as preprints or post peer review models. Punish, denounced. Create Reflexivity and critical communities. Bubble or isolation. Rules of the writing process.
<b>ETHICS OF PUBLISHING</b>	Publish or perish. Predatory journals. Predatory companies (double taxes). Intellectual property (Creative Commons). Fraud (Invented data). Authorship and contributorship. Copyright. Dissemination and visibility. Post-publication discussion and correction. Carrousel of articles (Vicious cycle). Misconduct.
<b>RESEARCH ETHICS</b>	Peer review process (Complaints and appeals). Conflict of Interest / Competing interest. Data management. Evaluation system (Design to be perverse).

Source: Created by the author, based on semi-structured interviews.

## Annex 14. Future Scenario Scholarly Communication

Look at the future of scholarly communication from different angles to develop strategic horizons and scientific knowledge and its relationship with stakeholders in the Publindex policy instruments' Colombian context. It depends on the institutions' autonomy to transform the model of scientific production and dissemination. Each scenario is described below (Table 20):

**Scenario 1, Institutions Publisher of Scientific Journals.** Universities that decide to continue publishing their scientific journals as a way of preserving knowledge. Some risks are the balance between exogamy and endogamy, the inclusion in international indexing systems, over costs of inclusion in the different national, regional and international indexing models, excess of journals due to specific incentives such as decree 1279 that leads to having more journals than necessary, particularly in the case of public universities. One example of developing a university model is:

The GUPPL is a shorter version of Shieber's Harvard model policy and explanatory notes. It is a simple version to fit on one page in Chinese and English to aid communication. The GUPPL is, however, not the same as the model policy. Librarians consulted academic authors on the model policy and notes, as well as good practice, a published case study, and the arXiv Licence, finding a balance between brevity, rights retention, author autonomy, and scholarship (Zhou et al., 2021, p. 5).

**Scenario 2, Visibility and accessibility knowledge.** One of the main challenges is the accessibility of knowledge. Therefore, some of the proposals are in terms of the technologies to develop new channels of communication:

Along with the evolution of commercial e-publications of all kinds, 'alternative' dissemination initiatives of varying character and composition, such as SPARC, the Budapest Open Archive Initiative, and arXiv (formerly the Los Alamos Physics Laboratory Archive), have established themselves and are considered by some to have "broken the mold." (Davies & Greenwood, 2004, p. 159)

**Scenario 3, Internationalization.** The indicators of the rankings under the model of scientific dissemination indicators, such as the impact factor in the international databases of WoS and Scopus, continue to be a scenario for some institutions, which creates incentives and bonuses for the production of journals. The challenges they face are the APC model of paying for published articles and paying bonuses, which balances the institutions in terms of budget. Some of the future scenarios presented are

**Subscriptions, the predominant model.** Most subscriptions take the form of 'Big Deals' where institutions – generally libraries – pay subscriptions on behalf of their staff and students to publishers to provide access to the needed literature. **Open access publishing model (for journals and monographs).** Publishers make their content freely and immediately accessible with clear usage terms. They fall into two sub-categories: First, publishers levy charges (APCs for articles, BPCs for books) when the content is accepted for publication. **Mixed publishing model (subscription and open access).** Publishers who practice the subscription model offer open access with varying timeliness (ranging from immediate to a delay of many years). (Guédon et al., 2019, p. 15)

**Scenario 4, Incentive research performance.** In different contexts, the indicators of scientific production have been considered salary incentives, in some cases by decree for public universities and other cases under private institutions' academic regulations. This has led to various practices or behaviour of scientific communities. Thus, one of the critical issues is the definition of research performance indicators.

The Library also advocated signing DORA to align with UK recommendations, UK institutional policy developments across universities, and some academic author perceptions of the 'tyranny of metrics.' DORA articulates the need 'to assess research on its own 'The UK-SCL is a policy and license to support compliance' merits rather than based on the journal in which the research is published,' and to make assessments based on content rather than publication metrics. In DORA, the Leiden Manifesto, and the more recent Hong Kong Manifesto, there is a growing focus on the quality of content in research when assessing researchers. (Zhou et al., 2021, p. 2).

Increasingly, however, it is becoming clear that a new perspective is needed. We need to acknowledge our myopia. There is some progress in this direction, with tools that harvest research information and connections across multiple sources to enable real-time portfolio analysis (Haak et al., 2012c). Moher et al. (2018) identify and summarize 21 documents on the topic, including the Declaration on Research Assessment (DORA, <https://sfdora.org>), which calls for the recognition of the many and varied products of research, “including research articles reporting new knowledge, data, reagents, and software; intellectual property; and highly trained young scientists. (Haak et al., 2018, p. 2)

**Scenario 5, Broker Knowledge from Data Science.** Technological changes have led to rethinking the models of production and dissemination of knowledge, in which analysing the process rather than the final output has begun to transform the ways of producing and disseminating scientific knowledge, areas such as computer science, have focused on creating repositories where the qualitative or quantitative data set is the information that is shared. This perspective from data science comes to life to have new ways of producing and sharing knowledge with stakeholders.

“COVID-19 research is accelerating open science more rapidly than ever before. For example, preprints are helping researchers share their research outputs immediately, sometimes along with their datasets. Besides, like a physicist trying to analyze the COVID-19 dataset and proposing a model, cross-disciplinary communication is happening regularly. Here, data science is playing a significant role. Furthermore, trans-disciplinary communication between scientists and citizens is also happening to solve this crisis. At this point, we must recognize that such emerging communications are happening but are not closely related to the currently established journal publishing scheme. 1. change the phrase “publish or perish” to “share or perish” to communicate the open science paradigm's image. Preprint first (at least for authors' priority) 2. Data sharing as a standard practice (like citations) and partially mandated (not all) 3. It filters multidimensional views through transparent methods, keeping established editorship and peer review for a trusted authority. And what I am convinced of, even at this stage, is that data science helps to widely and deeply improve our current situation incrementally, make something happen, and convince stakeholders to earn their trust with data. (Hayashi, 2021, p. 1)



**Table 37. Universities Roles the Colombian scientific journal index and policy instrument Publindex. Future Scenarios**

University role Publindex	Policy regulation	External actors	Policy Regulation	Functions	Problems
Publishers of scientific journals.	The institution creates and develops own scientific journals.	National Council of Accreditation program to assess quality of universities, faculties, departments and specific programs -doctoral, master and bachelor-. Ministry of Education Decree 2912. Academic Performance. Colciencias Publindex national to index scientific programs.	University Boards, Rector, Academic and Research Units, Strategic Planning Office, Faculties, Ethical Committees, Deans, Departments, Academic and Scientific Committees, Editors, Editorial Coordinator, Researchers, Support Staff (Press, Library, Technological Office, printing).	Develop editorial process, develop peer review system, develop and maintain academic and scientific committee, index journals (national, regional and international systems or private and public systems, directories, data bases and index systems).	Endogamic vs. exogamic models. Incompatibility with international systems when publishing in international journals. Open access vs. copyright dynamics, the high cost, resources and infrastructure to develop an international journal index in top citation systems.
Visibility and accessibility of knowledge.	Policy incentives to define the cycle of visibility and accessibility of scientific knowledge in the university. Potential models: open access, copyright, hybrid model. Define the specific outputs (blogs, social networks, journals, articles, reports, etc.) or incentives to legitimate in the academic and research community.	Open Access Movement in LATAM as Clasco, Public Knowledge Program and Open Journal System, Association of libraries with repositories system interoperability, altmetrics movement, researchers who push the system to develop new alternatives. Webmetrics system to rank the open access information of the institutions. Current research information systems as CRIS in Europe or OCU organization in LA.	University Boards, Rector, Academic and Research Units, Strategic Planning Office, Ethical Committees, Faculties, Deans, Departments, Researchers, Support Staff (Library, Technological Office, Communication Office).	Develop research information system with interoperability to the national and international systems requirements or outputs (Research Academic Units). Develop the policy and the system of institutional repository (Scientific and Academic Committees). Define intellectual property to establish which knowledge is patentable, commercializable or of scientific accessibility in open access, copyright or hybrid models.	Intellectual property regulation to define the level of knowledge (inputs according with the mission or context vs. commercializable, patentable vs. publish or perish). Curator of the quality and ethics of the knowledge publish under the institutional umbrella.
Internationalization (positioning in the rankings).	Policy to incentive internationalization. Publish articles in the top scientific journals.	Ministry of Education internationalization program. Colciencias new measures institutions, journals, research groups, researchers with internationalization criteria in the data bases of Web of Science of Thomson Reuters and Scopus Elsevier. Publisher companies, Thomson Reuters, Elsevier. Specialized data bases as IEEE, Philosopher index, Jstor, Sociologic Abstract, Econlit, other disciplinary systems.	University Boards, Rector, Academic and Research Units, Ethical Committees, Strategic Planning Office, Faculties, Deans, Departments, Researchers.	Define the specific channels of scientific communication per discipline in terms of quality and proposal. Ethics and Publications committees. Academic, research units and library training for researchers in the data bases systems and in the written skills as in the journals or systems to publish.	Gap in terms of the access of the knowledge (the librarians pay for the access of specific restriction of the knowledge) but not every institution has the resources to pay for it. The research agenda in terms of the data bases publishers who define "hot topics" to index journals and articles, this is a "vicious circle", not always the topics are in interest of countries development.
Academic production. Performance. Incentives. Salaries.	Policy incentives to define the specific performance output in terms of knowledge production "publish or perish" and salames.	Ministry of Education Decree 2912. Academic performance. Colciencias measure system. Ranking systems.	University Boards, Academic and Research Units, Human Resources (incentives program), Financial and Administrative Office (budget, projection).	Define incentives in terms of knowledge production. Researchers publish or perish in terms of an increase in salaries or bonifications.	The low diversification in terms of knowledge academic production to performance. Too much focus and pushing in scientific articles incentives as a main research output.
Broker knowledge.	Transfer knowledge to society, specific sector, industry, discipline.	DNP Regalias program, organization as consultants, fundraising organization.	University Boards, Academic and Research Units, Strategic Planning Office, Ethics Committee, Faculties, Deans, Departments, Researchers, Transfer Technology office.	Develop business intelligence or technological surveillance in specific fields, industry or disciplines.	The priority in publish or perish models, related with research articles, which doesn't consider consultants or other models such as research engineering, business, or other models related with consultants.

Source: Created by the author, based on semi-structured interviews.

## Annex 15, Interview quotations

### *Responses Tensions, multilevel actors. Private University Social Mission –PRUS.*

Interviewed: Sixteen people, three directors, four managers, seven researchers, and two editors. Firstly, the main frictions are maintaining the institution's internal journals with the new regulations of internationalization. Secondly, the inequality in re-conceiving the forms of production of areas such as social sciences and arts. Below are the actors' responses by tension and by level in the organization.

### **Tension 1. Internationalization, Evaluation Mechanism, and Incentives**

#### *Tension 1.1 Internationalization*

The principal remark is what are the scope and limitation of the policy to frame quality standards. Some interviews consider that the production of knowledge systems has been marketed in the globalization of knowledge.

#### Level 1

Rectors and directives. The secretary of the rector mentioned:

Publindex we do not know with absolute clarity the purposes; we do not know if it is an option of political strategy for government-oriented allocation of resources for research or assignment of scores for citations.” In the same direction, the Library Director considers, “From the point of view of policies, we are more like imitators. We imitate what happens. We adopt strategies. We adopt policies from other environments, we are very supportive because we had a recent period of support strong international by experts but with a very commercial orientation and that is not good for the country, we saw, for example, a considerable influence of the Santander group from everything the work that has been done with Universia and that is why we see that one of the strategic partners Scimago.

The literature is mentioned as allomorphism (Vaira, 2004) or isomorphism (Kein, 2014).

## Level 2 managers.

One of the comments is to include other types of knowledge that are local or with other circuits of production. Managers research vice-rector, Art, and creativity. “It does not have to see the local journal and stimuli. It is not pertinent to publish from the outside for those areas, which is the problem that Publindex tries to establish with the global journals. What it has to do is fill a void in the box but also where there is important scientific production for Colombia.”

## Level 3 Researchers

### Researcher Philosophy:

The country does not have a science and technology policy, comes outside, and is a phenomenon in all parts of the world. The rankings, measurements, and criteria lead to a very unconscious and dangerous homogenization as if there should be no differences in projects, educational policies, or research.

### Research in Social Science:

I do not believe that there is a reliable, clear policy in the long term. They are deeply harmful to knowledge production dynamics, circulation of knowledge of communities located in a context such as Colombia. Such specific places of the conversation of the different world disciplines, by definitions that exceed them and hardly understand, conceptualize knowledge politics.

Research in Medical Science, “The idea of Publindex seems excellent. I think you had to put order to the publications. As you probably know, it was lent to abuse. The idea seems great for those who wrote the newspaper made it worth a scientific article, and any low-quality pasquín classified, in short, bony. There is another serious problem with Publindex. Judges of all journals of all disciplines, with very similar criteria, should not be the case. A diary of a medical specialty, for example, has a purpose very different from a social science journal, or even more should be working those who work in, is that you do not think about research and jurisprudence, in theology.

### Research in Business Management:

The universities' requirements in terms of accreditation. One can quietly call cultural imperialism in terms of research and publications and say only English, North American, and European Journals are good. Those are the ones to point to. I think it is an unambiguous expression of what we can call cultural imperialism in the field of science, technology, and publications.

### Research in Natural Science:

I don't publish much in a local journal, because, not because local journals can't be engaging in the field of natural sciences, biologist, this *Caldasia de la Nacional* that is a journal that has its years and so on what happens is that. The problem is the dispersion of the information because if you publish in a journal like *Caldasia*, the Colombian biologists can indeed read the article, but it will remain local.

### Level 3 Editors

#### Editor in Business Management:

It means that they put us to play with some global logic and those global logics somehow have behind an implicit model. What are the natural sciences model, the Impact factor, and the citation by the purely academic, but with that vision of the natural sciences, I show that this was a discussion in the fifties, in the United States? Became rigorous but lost relevance, they distanced themselves from the business world.

Social Science and humanities “The first is unjust to say that Publindex is no good. I think A good part of the Publindex system allowed to rate how journals were classified in America in Colombia and lastly and in Latin America.”

#### *Tension 1.2. Evaluation mechanism and the manipulation of indicators*

#### Level 1 Rectors and directives.

The secretary of the rector mentioned, “We are talking about great volumes of information, of an expanded number of scientific communities, but I do not believe that it is a

phenomenon exclusively marked by the appearance of the revisions.” On the other side, the Director of university press comments, “A central preoccupation on the part of the organs of government of the universities of the indicators of investigation, that causes that also, those two things cause that the publishing house changes.”

Academic Research Vicerrector:

They add to the communities without looking at the social area and impact. They do not place a comprehensive adapted model. Evaluation instruments are built with academic communities that recognize a country's characteristics, with the Colombian University's understanding generating articulation with quality assurance systems. Lack of human resources prepared in the decision-making area that can mark country bets with development plans.

Level 2, Research Manager Art and creativity: “It does not have to do with local Journals and stimuli but for those areas that are not relevant to publish outside is that this is the problem that Publindex tries to establish with global Journals.”

Level 3, Researchers

Researchers in Philosophy, “The type of publications that are made, which we have, there are fewer publications in philosophy and humanities that reach the indexes or the impact factors that other types of Journals reach.”

Research in Social Science and humanities, “I do not know anyone serious globally, which I can respect intellectual who says that this is a quality indicator; this is a visibility indicator.”

Research in Medical Science,

Colombian researcher who was about to send an article to a Colombian Journal or an international Journal will send us the subject, what are you investigating and we will look for Colombian references for you to cite them, please, look at this work. So we do not meet with each other while North Americans do North Americans.

### Research in Business Management:

The pressure, the citing clubs are the compadrazgos (you cite me, and I cite you), the abuse is given, the self-citation, the subject of the contracts in terms of what can and cannot be cited. So not only in Colombia is it falling many times into a meaningless purism, to preserve the "integrity" of some indicators that in the end one would say that some aspect may be essential, but structurally they are not to assess the relevance.

### Research in Natural Science:

In *Frontiers*, for example, one of the useful things it has is the number of times the article is cited, the number of times the article is downloaded, the number of times the community considers the article. So I think that there is a lot of work to do to evaluate the articles and not the Journals, but because while we have that, we continue with the Journals that give this impact is to give the best we can do well for the moment.

### Level 3, Editors

Editor in Business Management, "Problem generating knowledge conditions in which it generates, the for what? for whom? and from there to understand that, to problematize, politics is defined".

Editor Social Science and Humanities, "When you see the citation levels of most of the jobs that arise or arose in the region are all short, that is, if the official cronyism would be growing sustained on a citation and that has not happened.

*Tension 1.3 Incentives for scientific production and in direct response to the Publindex policy*

The actors' remark on diversity Incentives for natural and social science includes local relevance and balance teaching vs. research.

### Level 1

Rectors and directives. The secretary of the rector mentioned:

I could define it as a necessary evil, that is, in itself, any system of rewards and rewards for scientific publication generates distortions, strategies, and tactics that generate the rewards without necessarily signifying quality or improvement in scientific production. I believe that both methods of allocating direct salary points or the method of unification without allocating salary points if we could say that these are two methods. I believe both have advantages and also have opportunities that must be corrected.

The Library Director commented, “I work very in institutional web metrics, which made me very full of all the variables associated not only in invisibility issues but also in production. Affect and promote and carry out that and end up then involved in all measurement processes, in the teaching ladder, in the process of incentives of academic production, in the editorial lines of the journals, in the editorial process of books the subject.”

Director university press, “The concern of the Colombian State is legitimate in terms of the amount of money spent mainly on the salaried, is legitimate. But, if there were terms of science, I do not see it so clearly, and to the extent that students and professor’s researchers and researchers are discarding what a thing is produced only for points.”

Level 2,

Research Manager in art and creation, “Validation mechanism, we were able to accept that the artistic fields have their validation circuits. We needed to inventory ourselves an evaluation from zeroes. Established circular works spaces mechanism conservation and curation as festivals.”

Level 3, Researchers

Researchers in Philosophy, “I think that at university, our experience has been that we have had to learn a lot. We have had to go through a learning process of nothing because, practically, our research did not exist with an organized system until recently. Still, it was an isolated issue, without major incentives, etc., and in this learning process, we have gone through stages.”

Research in Social Science and Humanities, “That should be abolished. I do not think people have to pay more for what they do: people who do science because they do science. They should not pay more or less for doing good or bad science. It should bring the scientific

community that reviews and discusses the relevance of people's work. That should not be monetizable because what is done is the prostitution of papers, and what is done is that people publish more things that are not necessarily better.

Research in Medical Science “Ah, there's Boehringer, Roche, and Bayer; so for me, it is straightforward to get micro incentives, such as guaranteeing the presentation of that work in a congress with a pharmaceutical laboratory. Whereas if I were investigating in, I do not know, pure entomology, there's interest in how the moths reproduce, that did not interest anyone”.

Research in Business Management, “To the extent that the universities for x or y reason have wanted to point to the issue of the qualification of people and of production and activity in general research which means hiring doctors or financing the information of the doctors and then obviously pay them accordingly.”

Research in Natural Science “It is something pedagogical. We think that everything can be done on the run”.

Research in Science, “I'll tell you something, this book was published this year in August 2016 is a book I did with some North Americans on issues of genetics and evolution of primates. In 2010 we published one book on Rio dolphins. In theory, when it sells 100 copies, the publisher has to give a royalty to the two editors of 15% or 20% of each volume. I know that we have already passed more than 100 books on this and the previous Rio dolphin. Do you think I have ever claimed the royalties? No, because for me that's not important”.

#### Editors

Business Management. “I believe that the incentives are necessary, and I repeat if it were not for that in faculties like the administration, there would be no investigation. When the indicator leaves, the mess becomes important when mystified when it is fetishized when given magical powers, and it is thought that applying it and that works. Incentives but incentives are a means here have become the objective, and researchers work to generate knowledge not to help solve the problems of their reality”.



Social Science and Humanities, “The problem is conditions in which the country's incentives of the researchers' society are given, that is to say, again there are questions of those that have to be solved more understanding the dynamics of the context where it is giving. I know for which genetic research laboratory of the Toulouse university where my friend Müller has resources has several things that the doctorate students must finish. I believe that Decree 1279 is perverse because there are incentives and tied them to the lifetime salary. I think it is one more issue that psychologists have researched how people who support learning learn, and the issue is that incentives can increase learning behaviour and behaviour. Still, if incentives are not properly administered, they can end up generating curves that do not stabilize or fall off the issue is that incentives alone”.

## **Tension 2. Epistemic Communities, autonomy in research agenda, and ethical misconduct.**

### *Tension 2.1. Epistemic communities, local vs. international construction*

Level 1 Rectors and directives. The secretary of the rector mentioned, “The current system of recognition of scientific production weakens the construction of scientific communities in social and human areas. I believe that this is a recent phenomenon. It is not a long-standing phenomenon in Colombia. Thirty four years ago, or if we wanted a little less twenty-three years ago, academic communities in the social sciences and humanities were tremendously strong, not concerned about the current circuits of knowledge production in the internal circulation of knowledge communities. I am referring to lawyers, historians, philosophers, social scientists”. On the other hand, for the Library Director, “there appears another problem, Colombia. Many times in almost all of Latin America, we have difficulties doing collaborative work with international unity. It is not so much because the journals do not accept them but because they do not understand that the phenomena that occur in small communities also have global implications and very great interest on the international community”.

Director university press, “One of the things that are on the table is an evident tension between a series of ideas, reflections on the perspective and the relevance of doing science in the country. Let's say local science versus a series of intellectual Taliban that they enact an excellent connection between what is produced and the thousand ways of making knowledge visible in a technical way.”

#### Researchers

Researchers in Philosophy, “I would be very cautious about talking about the Colombian scientific community. I think it is a tiny, Colombian scientific community that is as if it did not exist, and we believe it exists. Then we believe that creating a bureaucracy or talking about it and that's why the things exist.”

Researcher in Social Science and humanities, “I would like to insist that the problem is not one of the Social Sciences. The problem is the terms and conditions in which knowledge is produced in Colombia, guided by the business interests of the large publishing houses is a problem for all the Sciences, not just a problem for the Social Sciences.”

Research in Medical Science “These cycles of scientific production are leading us to delay decision making that can be real-time. Yes, let's see, the subject of the relevance of research is one of the great themes in science”.

Research in Business Management, “From the university. We can describe this micro-community as a community of four cats. It is difficult to think that this scientific community has the critical mass to speak, in terms of volume or terms of networks interactions.”

Research in Natural Science “For example, they are journals with more than a century of tradition. I remember the first Journal published in genetics and good because it will not have such a high impact factor. Still, I know it is a historical Journal, and other times it also depends on the repercussion that you know your work may have.”

Research in Science, “Nowadays, that is diluted because there are many publishers left. For example, a springer publishing house takes Primates, the official journal of Japan's

primatological society, and was a local Japanese journal. Springer already took those journals. Then, of course, when these international publishers take those journals, it ends up being a little important; which is the country? Because you know publisher has strength since the publishers cover the market and that today through the Internet reach all sites if?”

Editor in Business Management, “Became rigorous, but they lost relevance, they left the business world, abandoned reality, have nothing to say to the companies. Then gained rigor, but lost relevance, and lost legitimacy.”

Editor in Social Science and humanities “There are invisible schools in psychology, but first I will tell you something about that area, there are 1,200 open access journals in Latin America. Explain to me the social science community. I have those fights with my knowledge of colonialism. They cite the French articles again on neo-colonialism because they don't cite the publication in Latin America. After all, Latin America is an open access model. Those two systems have allowed people to have access to that”.

*Tension of 2.2. Autonomy in the research agenda, mainstream no mainstream knowledge*

The interviewer's remark on the importance of identifying research agendas, where the relationship visibility vs. relevance interest is a challenge for knowledge management regulation.

Level 1 Rectors and directives.

The rector secretary mentions, “The institution must find the mechanisms to counteract this iceberg-headed effect that is presented. What are the mechanisms that an institution has for this? The problem is that there is not enough clarity with public policies oriented to the topic, but at the same time in the universities, the difficulty of establishing clear lines on which to focus, on which to work to be able to take advantage of the potential that universities have”.

Level 2 managers.

research vice-rector, Art, and creativity. “There is not much what happens is that also when you speak of arts. For example, Musicology is also very good in the middle if there are enough journals, but musicians are not interested in publishing in journals”.

Level 3 Researchers

Researcher in Philosophy “Not always having been published in a journal with a very high impact is an indicator of quality. There is a perverse game that the evaluation system can drive researchers to publish in such a way that its publication is recognized, so it is not of high quality, and that will be a total perversion of what is sought with the system.”

Researcher in Social Science “I believe that the university is not a coherent entity; there are many experiences in that sense. I think there's a lot of confusion inside the university with these rankings, with the visibilities. Those terms and conditions of visibility are opposed to a very political and ethical vision of knowledge”.

Researcher in Research Medical Science “I believe that there is discrimination towards our studies, that is, I always insist that a work of a publication, an article has to have a so what? At what, what do you get out of here? So if so, what? Is this disease costly in California? How interesting, but if you say this disease is costly in Colombia, people say: What? Then it must have like something else”.

Researcher in Business Management “The construction of knowledge is social and that by their characteristics, they have to benefit everyone and not necessarily is mediated by the monetary factor.”

Researcher in Natural Science “In my area of immunology, it is very evident that if you want to publish something of very high quality.” Researcher in Science “If it is a subject that has to do with human cancer research that will be the bone, journals, and publications and indexes are going to favor that type of research instead. If you dedicate yourself instead of studying human's certain types of animals, certain types of plants that have no commercial interest because of course, the field of output that has these publications is going to be smaller.”

### Level 3, Editors

#### Editor in Business Management

“Top Journal tends to follow very cute disciplines, and that kills. What happens in many areas of medicine is not only proper in this area of knowledge but also related to national and international publications, cultural imperialism, production and knowledge dissemination, and fact also with the theme of the creation of communities, networking”.

#### Social Science and humanities

“What I think is that researchers in Colombia are in the process of transition, and since we do not have the economic infrastructure, the country does not have it, the researcher has to write scientific articles that can go to Journal of different levels of impact.”

#### *Tension 2.3 Ethical misconduct (Publish or perish). Predator behaviour*

Publish or perish create types of behaviour, including the repurchase of one's knowledge. A possible solution is a demand for pairs in editorial challenges.

### Level 1

Rectors and directives. The secretary of the rector mentioned, “I believe that we are facing terrible cancer in the production of knowledge, and we have to go to those who do not live from that, which I believe exist, right? The passionate ones who want to contribute don't have the publication's driver for the reward.

Library Director, “The journals also begin to have, which are journals that usually do not have the recognition nor the level of demand and are usually young journals or journals that have such low impact.”

Academic Research Vicerrector “Much of the scientific production is not consistent or relevant to the international circuit. In order not to perish, a citation is part of the capacity to transform”.

#### Researchers

Researchers in Philosophy, “Falsification of data is an incredible thing. Researchers interested in specific experimentation and fits the publication's data interest, finance

activities, and other types of projects are unethical. I think that reminds us that humans do research. Research is subject to ethics, principles, and transparency. Not only impact assessment systems.”

Social Science and Humanities, “It would be fascinating to contrast what people, professors, and academics were doing in the 80s and 90s with what is being done now. This system is designed to stop producing knowledge more and more, and I'm not even talking about critical thinking that this is already a question of a museum, so it's a very problematic situation that not only has to do with science”.

Business Management, “In Colombia, there has been a discussion for some time about what are research books and how they are valued, in front of Minciencias and universities, which seems stupid to me because there is no guarantee that to publish in Journal x, there is no evidence that this is more valuable for the scientific and local community than to publish an article in a book, in fact, this publisher or perishes has more surnames, is much more specific. Also, you have this twin brother, publish, "trash" but publishes or perishes.

Natural Science “That is a severe problem. I'm the editor, Frontiers. At Frontiers they have, the incentive is the number. The publisher says they pay. I am the publisher, not pay. They named me editor, and they started sending emails to everyone, to submit articles for publication and then let's say with the Good Will and the value that the Latin American community of immunologists represents then many people decided to submit trivial publications”.

Research in Science “Researchers have to compete. From what is competed, there may be researchers who are tempted to compete unfairly because then there may be infinities of ways to compete unfairly.”

## Editors

Editor in Business Management, “Academic capitalism is expressed in a duopoly, imposes market conditions on academics. It is a sheath if in the legally decriminalized market because it should be more culturally and socially punish it more than its core.”

Editors in Social Science and Humanities, “I want to know why an article on forgiveness in Colombia is more cited by people who are outside Colombia than people who are outside Latin America, than people who are in Latin America. That is not the responsibility of a universal system. People in social sciences and psychology should also ask how their communication practices and how their communication uses are and that one question should be a reflection instead of being responsible for forgiveness systems.”

*Responses Tensions, multilevel actors. Private University Excellence Mission (PRUE)*

Ten people were interviewed: two directors, three managers, four researchers, and an editor. For this university, the priority is international excellence. They focused all their policy on the highest international standards—each of the interviewees identified the line of distinction and internationalization. The primary friction is in finding the balance of bonuses and evaluation criteria by discipline.

## **Tension 1. Internationalization, Evaluation Mechanism, and Incentives**

### *Tension 1.1 Internationalization*

#### Level 1. Director

Director of Industrial Engineering Department. Then begin to create second-level Journals where the community starts to validate their ideas. “I do not feel like those local journals. It is excellent that I publish and suitable. That I have the discipline and know-how to do it, and in excellent or high impact journals at an international level.”

Director Library “To say it in some way is a very skewed system. It is challenging because you need systems that are friendly not only with the researcher and the librarian but reliable, in the sense that if they correspond to reality, then that depends.”

#### Director. Economic Faculty Dean

“In the scientific community of economists. Local and regional journals have not managed to take off and reach a level of international recognition; that allows us to get there. Then, we use more standards in international communities, for good or bad. But we have never used the Publindex.”

### Level 2 Manager's

Research Vicerrector, "They no longer do the indexing career, but there is no university policy, as we do not have the pressure. We do not feel like the public university must have a Journal by the program. Here it has arisen more by the interest to spread the interest and others. Today we have said the few we have would take them to very high levels of indexation. We have one in Q2 and Q3."

### Level 3, types of research and editors

Research in Engineering, "Publindex had a problem in its initial approach to separate national production from international production. They made the classification with some national classification standards because the journals were at a deficient development level. Simultaneously, they had a parallel classification called Publindex homologated, which homologated these international journals".

Editor Social Science, "From my point of view that was going to make the level of the discussion, not a review of funds of the entire structure and the scaffolding that is behind the research of the research groups and the academic production, and it is all a roll because Minciencias will give up."

### *Tension 1.2. Evaluation mechanism and the manipulation of indicators*

#### Level 1, Director

Director. Industrial Engineering Department, "Currently for one to consider that one has a publication as a source for the entire process of evaluating one's career as a professor of the academic career, the ideal is for the paper to appear in an ISI or Scopus Journal, so that is like an obsession and that's it. So when you measure a critical aspect of evaluation, there are three dimensions: any teacher, the teaching part, the research part, and the institutional development part. The quality of their scientific production must be so good that the program is local. It should not be a limit. It should position it at a global level and say this is something we did in Colombia. Still, it serves a wider community or this local experience the global community must learn that the next step is not only to say I will publish, but publishing is also good".



Director Library, “We use them to teach. People know which are the best Journals in their area. For example, learning services, search for information, training, language learning, academic tools, workrooms, research profile, scientific production evaluation tools, impact index, standardized signature, unifying productivity, and profile creation.

In that order, some indicators seem very good to them. Others do not appear so right depending on the area, depending on their level of research. For example, we got the indicators and the reaction of social sciences, Arts, and Humanities. It was terrible because they did not want us to publish that those measures came with everything. Still, the area of social sciences, arts, and humanities did not come with anything. Still, there is no way to do it”.

Director, Economic Faculty Dean

“I believe that these indicators are helpful but so that the indicators are at the service of scientific production, but when scientific production is put at the turn of these indicators and these metrics, I believe that we run a very significant risk. We need metrics. Let's just agree on them as a scientific community. We have to decide on the disciplines and the interdisciplinary metrics to find a valuable tool for better researchers.

Level 2, Manager's

Research Vicerrector, “The idea of college is to stay out of these issues. We try to always go for quality and not fall into these temptations. Even Colombian universities have entered the rankings and appointments and have hired professors to put the university's name very dangerous. It is time to be very attentive. I can't tell you the name, but there's a private university that buys your base”.

Researcher's

Research in Economic, “Ability to evaluate, what one does is discard indices to the Colombian of intuition in data treatment (spurious indicators). U sapiens does not rank for the sectors with the least error, production, and size (quantity vs. Quality). The explosion of groups that do not group if I am 20 or have one, the group as a concept does not exist. The classification based on flat data, the added value of a group - human resources training, specialties, and full-cycle research”.

Research in Engineering, “Any system used to measure scientific productivity will be imperfect; in any case, the measurements should be objective.”

Researcher in Physics, “I think that in my case, it works in my favor, but there is no case. I know of people who have won the Nobel Prize in physics, who have abysmal scientific production and suddenly have a publication that changes their career, so I think the number has nothing to do with the impact. My policy is not many articles but good points. For example, I publish all the time in Q1 Journals, I am tempted to publish in Q2 and Q3 Journals, and I prefer not to publish in Q2 and Q3 Journals to maintain the same level of always publishing in Q1. The H index is very much in my favor, but no, I try not to let myself be carried away by it publish or perish”.

Editor Social Science, “The Journal could go out with everything international, completely, why it doesn't, because we think that we want to give it space so that our production can also be used even by other academics in this community. It's not me; I mess with everything else or all the academics there and leave out my own. No, I mean we must also take care of them inside this space, then, we are on that route.”

*Tension 1.3 Incentives for scientific production and in direct response to the Publindex policy*

Level 1, Director

Director. Industrial Engineering Department. “I think so because we still need it. There are many distractors in our society, at university, including having a good income. So let's say one has a load of courses or some activities that one has to do and besides another possibility is research. Still, in our context, there are so many possibilities of doing so many things that move the potential researcher to dedicate himself to some things we call lucrative or in the short term, and I could say perfectly well I dictate these courses. Still, I could dictate one more, and I earned something extra. So we have that kind of incentive in a sense. There is a review process that you don't know what is going to happen. Then there are in some way incentives, get published in journals of this type of level or these standards

because we will recognize something, and that seems to me to redirect people to what ends up being important for a university that wants more exposure in that research process”.

### Level 2, Manager

Research Vicerrector “We only move with international standards, and we don't have the problem of 1279, so we simply ask professors for publications, articles in Scopus govern the entire university. Publindex is of no importance to us. In terms of the bonus, It's very variable throughout the university. The vice-rectory does not give bonuses for scientific production. Still, each unit does, and it is something we want to discuss at some point because you can have bonuses of millions of millions in Economics and Administration and one hundred thousand pesos in Biological Sciences”.

### Level 3, Researcher's

Research in Economic “Good incentives, but there is a big risk. Universities were not publishing. A historical moment is valid to encourage; learning how to publish a learning curve for universities generates a research and accreditation culture. Failure not to change incentives decrees 1279, 2912, and 1444 were important not today. It is good to place the incentive is bad not to change must move in time to change behaviour and avoid moral risk”.

Editor of Social Science “There are several types of incentives, one of the incentives is that our teaching career includes that. So that is a big incentive, you have to produce to stay, but it is not the only thing, not because you produce well it stays, because you can produce well, but if it is a bad teacher it will not necessarily stay or vice versa you can be an excellent teacher but if it does not produce scientifically either, and our model or profile of assistant professor associate owner tells you both the academic status of the University and our regulations of the faculty of economics very clearly says that our teachers who want to go through teacher regulation have to be good in everything, then that wants to include teaching, research and what we call institutional development of something is this administrative thing and that”

## **Tension 2. Epistemic Communities, autonomy in research agenda, and ethical misconduct.**

### *Tension 2.1 Epistemic communities*

#### Level 1, Director

Director. Industrial Engineering Department, “Without the spirit of not being arrogant or anything else. I do not feel that one should have like those local Journals where, I see a lot of say, in many universities we could even think of this, which were Journals were, and the university changed for not to mention other universities.”

Director Library “Well, that is relative according to the area of knowledge. In any case, the science areas are those that publish the most internationally, science and engineering, but the areas of arts and humanities are much more local.”

#### Director. Economic Faculty Dean

“We look more at what is happening outside. We could be losing sight of what is going on inside our institution or within the Colombian community. Thinking about what is happening with our local knowledge and indexing them, we know what we are not developing ourselves. So, yes, this can happen, or rather, we are definitely not fuelling the discussion of these evaluation and indexing systems and that kind of thing here. We believe that our research has a direct impact on what we do as economists”.

#### Level 2, Manager's

#### Research Vicerrector

“It depends on the area. Even in some areas, they are hired without publications because, in some areas, it is common that it is not even published in the doctorate, which I learned as vice-rector. Still, even in economics, they start publishing after six months or one year after graduating, they hire people, with a lot of exposure, but they do not have a publication yet.”

## Level 2 Researcher's

Researcher in Physics “If we say that this is a problem, I didn't think of it that way, especially if you want to give international visibility to the university. In the basic sciences, it also happens that changes don't happen so often; 20 years ago, the fashionable subject was nanotechnology, so everyone changed their notice to the laboratory to make nanotechnology. They kept doing the same thing they always have, so that what you notice and surprise me is that people move like herds, so if the Nobel Prize says that you have to research those new materials, then everyone goes to those new materials, then I say but why?”.

Editor of Social Science, “I would be very cautious about talking about the Colombian scientific community. Colombian scientific community is as if it did not exist. Creating a bureaucracy must work very hard to link with international networks and link the regions' problems. I think that is the first step to be able to speak in the future of the national scientific community.”

### *Tension 2.2 Autonomy in the research agenda, mainstream no mainstream knowledge*

## Level 1. Director

Director, Industrial Engineering Department “I do not know how it will be suddenly of regional universities and other universities. They are research-oriented to solve their problems after something comes out. I am convinced that there are many problems that we have not attacked, but I do not think that publishing in our Journal does it.”

Director Library, “Colombian and Latin American publications are not included in the top and are of the greatest importance in the area, particularly in the area of social sciences, arts and humanities curiously enough.”

## Director. Economic Faculty Dean

“Yes, in general, it is a problem that we have to face, and I am aware that we have to face it. However, it is less severe in economics because much of the universal knowledge of

economics problems are fed and nourishes local and regional issues. What I'm trying to say is, the cutting-edge research on monetary policy issues that are taking place in the top economic Journal has very great relevance to monetary policy and tax reform here in Colombia. I'm merely giving an example.

## Level 2 Manager

### Research Vicerrector.

It may mean both. It may not mean because local relevance is sometimes not published at the international level. The impact is something we achieve a lot, objectively with citation, but if we are aware that constitutional court documents have to be published. The teacher has to be recognized for that work, then we make that equivalent, and we tell Social Sciences we give them 10 Journal that is not in Scopus or WoS but that you think are relevant, impact and we make equivalences with Q3 or Q4. For me, I don't like relevance. For me, all research is appropriate, from fundamental analysis to the one that wants to solve a problem with a community. Everything is reasonable, and the vice-rectory has always seen it that way. What I do today has a more local impact.

## Level 3, Researcher

### Researcher Physics

I can see that question of not being part of the flock from two perspectives. One is assumed of this whole cite process is because you have created a community. Some say cronyism, others say it is the black market because you did part of that community, we cite you, and they cite you. We do the citation community, think that you come out of the box and think differently it can take you to someone tell you to look is this, or that you may get entirely out of the herd and do not cite you. It has happened that the last article that we wrote has 350 readings, but we still do not have any citations, so it's weird.

Editor of Social Science, "We will look for where to publish, but we do not offer anything to the academy. Is that not a double track? The bone we do not have to, and with an additional step, I told you right now, we are giving a grand entrance to the region's academics, but we are also providing dialogue to our academics

*Tension 2.3 Ethical misconduct (Publish or perish). Predator behaviour*

Level 1, Director

Director Library, “As a library, our reason for being is that our users have a basic formation.”.

Director. Economic Faculty Dean, “The indicators as a final objective. When the publication reflects a careful peer evaluation process, and those peers are part of a rigorous and honest scientific community, you probably heard Brazil's history. I do not know if you have heard it from the Journals that started a whole carousel. I put you in my paper, and you put me in yours, and you are the editor of that journal, and I am the editor of that journal. The editor of that Journal and you started that carousel that generated all this dreadful scandal there then you became the publish or perish target and not the medium that is an excellent example of the mistakes and risks of that, but if you build a rigorous and honestly demanding scientific community.”

Level 2, Manager's

Research Vicerrector “have lived personally, let's take these two characters out because the fewer authors give me money for my salary, the more they even affect the ethics of publishing, so let's take people out because they give the professor more money; once I had an anecdote that I went to present my work to the national press from an article in Acts Journal where we were 90 and a person raised his hand and instead of asking me a question about the article presented in Acts I was he tells me here they would only give him a point for that publication, so that's what it is, and politics in that sense, he was now telling me a postdoc of mine, that they gave him more points for an article they published on ideological news than for another links we have published on the number of authors and for other things that take points away from him, but they gave him more points for ideological news, they are not demanding that from me, if that's politics and not from me, that, if that's the policy and they're not demanding that from me”.

Level 3, Researcher

Research in Economic “What is the moral, political, and editorial risk? Measuring well in exposed communities is the problem of behaviour. The transition from mode 1 to mode two

is needed in full-cycle research. Generate a model of academic careers by behaviour and discipline”.

Research in Engineering “The problem in Colombia is rather few publications, little research, lack of preparation for research.”

Researcher in Physics, “It's clear that if I don't publish, I'll never become an associate professor if there's some pressure to publish. There's no minimum number of citations that you have to submit, but they review it case by case”.

Editor Social Science, “At the university have a plagiarism detection tool. All these Journals and elsewhere and that is an academic sanction I think it is also an issue of, look this is not so this does not work so”.

## Responses Tensions, multilevel actors. Public University Heritage mission

### Tension 1. Internationalization, Evaluation Mechanism, and Incentives

#### *Tension 1.1 Internationalization*

##### Level 1, Directors

Research Vicerrector “Minciencias understands the value of national journals so that we recognize the value of national journals, to know that we protect at the national level, that we open at the national level, that we take international journals, as that logic of production from the very local to the very international; and that ladder as we strengthen it, that ladder, that dimension as we build it, the university doesn't have many answers there either.”

Director of Industrial Engineering “There are more Basic Sciences journals than Human Sciences or Arts. I also think that there are areas where their tasks allow more publications to come out, for example, an area such as physics or chemistry”.

##### Level 2, Manager's

Academic Vicerrector, “Then Publindex worked, but it should have designed a more inclusive and fairer policy with universities and research groups. Making huge efforts to



publish quality regularly, keeping the evaluation protocols by academic peers strictly is evolving. Minciencias a due to enhance regional indexing systems I'm talking about SciELO, and I'm talking about Redalyc; also take the step to make their bibliometrics, but they are not even able to make the website work well”.

Academic Vicerrector Social Science “And what they talked about in the last academic event last year here at the National was Publindex is not a reference for anyone, I even remember that the intervention of the professor, the editor of Public Health was strong, right? It was, why do not we end with that, that does not help anyone, nobody takes it into account, it is not a prestigious reference to know the quality and position of a publication”.

Incentives Office “I think they are good elements that generate another state. We arrived at the other, and where is a policy Publindex, a government agency, the government is interested in internationalization then that is its goal. We return to the objective if you are aware of the national impact journals. It is a more political issue. Still, if you want to be the best on that platform, you have to put other steps to rise because there are journals that he is a teacher fighting against the world. I have pulled out his journals. They have zero support”.

#### Level 2 Researcher's

Research in Pharmaceutical Chemistry, “Let's say that these policies have led to publication in national journals, suddenly that could be visualized is in terms, that it is easier to publish here, and therefore at the time of recognition, either by categories of journals or by the score assigned by public universities, including private universities in the modality of them, because it is pretended that it is easier to publish here and that the categories are equivalent, that is to say, somehow compare a journal like, that I know, the journal Caldasia, the journal of the Faculty of Mines Dina in the National University in Medellin that are A1 and the same category have Science for journals such as the Journal Of American if that is seen like that, one could think that it would apply, but it is like the previous policy of Publindex, because the new one, the one that is expected to work, in a few months qualifies the local journals as well as the external journals, that is, there would not be properly a discrimination between Colombian and foreign journals, but simply, scientific journals”.

Research in History, “I do not believe that neither the universities, nor the system, nor our professionals have that level of contact and intellectual development to be able to make contributions that, as they say in the slang, remove the frontier of knowledge. In an underdeveloped country, I will devote myself only to moving the frontier of knowledge or for my community. It is more important than it helps to solve their problems.”

Research in Pharmaceutical, “Let's generate a Publindex as a system of stimulation and recognition because it was erroneously thought, that when national scientific journals were pulling those theses from the shelves. All the knowledge generated in Colombia was going to be put in the fair showcases, and the discourse has not changed, that the knowledge takes us to other economic and social statuses, cultural and so on.”

Research in Civil Engineering, “What if it is not in the Northern Hemisphere journals, right?. That ranked and indexes the Northern Hemisphere's publishing systems and the Publishers and Printers of books and journals of the Northern Hemisphere. They don't publish them, among other things, because one of the biggest headaches (which shouldn't be) is the issue of language. There is too much arrogance in Europe and the United States because of that; you have to be a little bit gentler with foreigners and help them, and I think journals could collaborate a lot and certain products that are good, then, should help to polish [them], with some style editors.”

Editor in Social Science Faculty, “The system has the possibility of becoming a great system of circulation of knowledge. The country's potentialities exist; the creativity and work capacity is enormous in all areas. But there is not enough critical mass of qualified researchers in all the fields, nor is there the support in the middle to maintain and retain those great investigators working in Colombia because the system is not able to retain them.”

Editor Engineering, “Publindex served to learn many things. It helped us appear on the world spectrum. That is, Colombia appears in many spaces, but nowadays, becoming visible is not enough. That is, I also have to be able to develop. There is also a problem that a research policy is defined from a metric. As a nation, you have to think about the

purpose of investing in research, where you want to go, and here we are doing the most because it is a copy of other models. Still, I do not think the purpose of investing in research; consequently, what is the purpose of measuring, what does it measure, what do I want to find? So consequently for me, beyond that, I think that you can find a value in Publindex and that we are tied to 1279 that works and trying to change it would be an even bigger crisis”.

Editor Biotechnology. “Publindex has curiously had a positive role in the administration system. I believe that the system, Minciencias, does not try to generate a rigged subsystem to protect the Colombian author no, which some suggest. I think that Publindex tried to generate a publishing culture with rigor, and if it has succeeded, if it has, then it has. That Publindex has problems, try to evaluate university academic publishers with quality standards by the results and not the process. So the fact that it has a quality system does not mean that the publisher is good.”.

### *Tension 1.2 Evaluation mechanism and the manipulation of indicators*

#### Value assignment alternatives

##### Level 1, Director

Research Vicerrector, “It is a cultural issue that must be worked on a lot, we must think about how we change this culture. Culture implies many things; credibility in local production implies training for local production and access to local production. It happens to us in the universities themselves. The universities themselves do not cite. We have a department that produces knowledge that they cite outside the university itself. The doctoral professors themselves do not cite the professor who is producing next door.”

##### Level 2, Manager’s

Academic Vicerrector, “They measure volume but not quality. What I think is that what these models have sought is for Colombia to have visibility. So you can't standardize the areas or measure everything in the same way. That's what these measurement models haven't understood or haven't been able to do. But what you say is true. There are all kinds of

things. Those situations belong to my peer or to the character I know that I think I have to cite. Still, there is also the grey market, and there is also the black market that I repeat, are the few cases counted, but I would think that we are more between the grey and the white, right? But what they are forcing us to do, I don't know. You cite the top journal because you have to be in the top journal. The only way is to see what the Dutch are doing, what the North Americans, the British are doing, and their context is not interesting. Because it is not what is on the border, so I think it is fascinating to reflect on how we investigate”.

Incentives Office, “Scopus is a company, and it is his business. But as much as he wants to leap forward in science and do it to have power. Nevertheless, I still believe in this. It's so lovely that it's research, it's creating knowledge, it's disseminating it. I work in the design part so that teachers can write so effortlessly and commit different actions. For example, a teacher didn't make the appropriate citations, and his director didn't even know because he didn't read it. He just cared that they were co-authors. How I tell you is an indicator; it is something structured and something that can be used. Since things like the ones you mention come up, it's accurate whether they cite you by inertia, by good, or cite you by bad if it was the one they found by google. How you are dictating course and sending a document to the undergraduate students they first find on Google. We insist that must accompany the scientometric process in the operative part but also an expert analyst.

### Level 3 Researcher's

Research in Pharmaceutical Chemistry, “In terms of scientometric, Colombia is still in pretty bad shape, that is to say, many people don't know what that is honestly. There is a comparison that shows Wikipedia. I think it was at 26 on Scopus, but if you're going to see it, the other thing you have to look at is that it doesn't distinguish between external citation and self-citation. At least the Scopus does allow you to, so on that basis, the last thing I looked at was 26 total and 20 excluding self-citations, well here it's not very clear, at least the author, of course, it's not that one base oneself as a reference in Wikipedia. Still, it's an encyclopedia, after all, then that's a contribution of information”.

Research in History, “I have always felt supremely skeptical, I don't write is a scientist for the large scientific community, I don't want to know what my web index is about, I write for small communities that is where I am thinking about the topics that interest me, the citations

feed the vanity of my work. I believe that there is a fashion of rigorist towards measurement. Measurement has its limits. Besides, we in Latin America publish minimal, logical many words, yes. Still, on the issues in which we are making findings that are clarified through dialogue, I believe that it will take you another two centuries to begin to discuss in our community of systems that interest more advanced communities”.

Research in Pharmaceutical, “The life of innovation, they are scientific, but they are of disclosure of the universities' departments, scientific societies that are disclosure. They fulfilled the majority of critical conditions of ISI and Scopus.”

Research in Civil Engineering, “I'm going to give you elements of that, for example, I'm telling you I've never applied to or applied to a project of MINCIENCIAS or the National University of Colombia! Never! Never! Now ask why? The truth is that I have been much more ambitious. The projects when I said, "Well here we have to create is that research group I don't know what to do and do I don't know how many to become triple-A or triple B or triple C to give you a project saying fifteen million pesos, no, no, no, no, it can't be! They have no choice! But the problem is coming back again.

Research in History “Rules of the game some posterior, allow for planning with time to adjust. Those forms of measurement are processes of great contradiction, mechanisms, and methodologies of nefarious evaluation. Annoyance, the rhetoric of academic rigor, what is intended is a tax saving. Soul to the devil the productivity of the indicators”.

Editor in Social Science Faculty, “Everything exists, from the arbitrated exchange between editors to the elimination of inbreeding, you talk to the editor of the Journal about such a thing. I am an editor of the anthropology Journal here. I look at my profile of publications of articles this year. Articles this year do not meet the criteria of exogamy required by Minciencias. One picks up and picks up the phone and says to him: "Compadre, I have six articles, already arbitrated, ready to publish, but they are not useful because they do not meet the standards of Minciencias. What do you have? "I've got eight, ready send me six," and we both comply, see and such arrangements, but they are deviations conditioned by the Minciencias policy.

Editor in Engineering “evaluation policy is focused on citations, certainly, and if that measures the quality and real value, it is not. All that you produce, how much is translated into a product of value. Not at all, because that is not the value, and it is not the time. That there is a change for one social group is another criterion”.

Editor in Biotechnology “First of all, they got into something that seems to me to be very complicated, and that is trying to evaluate academic university publishing houses with quality standards by the process, and that is not bad, what happens is that it is incomplete, it is incomplete because the academic publishing house, as the literature is known, is a specialized publishing house and besides being evaluated by reproduction processes, it has to be evaluated by the impact of knowledge.”

*Tension 1.3 Incentives for scientific production and in direct response to the Publindex policy*

Consider various incentives

Level 1, Director

Research Vicerrector “It has somehow managed to encourage research. It's not that it's the only thing. The professors do it, and they benefit from it. Many do it looking for it, let's say they publish, publish and publish, but I also know great researchers, very great researchers who have not agreed to a point where is the process is not. I even know the most recognized researchers who do not have a point. These two subject's teachers are simply convinced that their job is to be scientists and produce and expand their knowledge; some teachers produce by points. Although it is more equivalent to the same percentage of professors who produce by points, than the percentage of professors who do so because it is not the decree that drives them, is their internal dynamics”.

Director of Industrial Engineering, “My perception in front of that point is that it was necessary at some time. I am no longer so sure that this is the case. A norm governs us for several years, a standard that is decree 1279, issued in 2002. It fulfilled a function that no longer makes sense because its objective was fulfilled when that norm was given, a little

earlier in 1992, through decree 1444. This stimulus scheme was established due to the increase in productivity. Several years ago, this scheme had already fulfilled its objective, making researchers and academics aware of publishing's importance. At that time, the only tool that had to generate this stimulus, but it has spent many years now, is in a different reality, a different budgetary reality, with perspectives that do not need to be stimulated.

#### Level 2, Manager's

Academic Vicerrector "I would say that if it is necessary to adjust the model, but the model does not necessarily imply incentives of the economic model, that the system looks for another type of incentives evidently beyond the economic ones. Let's say the classic theorists of motivation speak of the short of belonging and a monetary incentive. However, there should be other types of incentives so that they can be much more comfortable. For example, finance research, access international agreements, participate in international seminars more permanently, disseminate scientific research in an audacious way. I think there are many ways to incentivize that go beyond economics. But other people do not. Other people only dedicate themselves to the puntimeter, as we say here, and do not consider that part of the social impact.

Academic Vicerrector Social Science Manager "What happens is that the Scoring Committee is a very administrative committee that applies [Decree] 1279 [From 2002]. The problem is that everything new does not enter into these committees because 1279 has been a decree for more than 15 years. That is why the Committee has entered into the aspects that 1279 did not directly regulate.

Incentives Office "I was on the scoring committee a year ago, and this is the headquarters. We are a support group for the committee's technical secretary, the university staff's general director. We help in all the active part to meet the requests, are some thousand offers, by regulation exercises the committee's technical secretary, all our floor is the decree 1279 that is the one that governs and how the law is operated here is the agreement 23 of 2008. Several professors have the same profile in the research but different points, which generates an additional income. Personally, the incentive dynamics seem to be a correct

initiative, the minutiae of understanding, and other forms in several countries. For example, the adjustments that Minciencias is doing in journal measurement-do not share some details, but in general, I think they are very accurate with the objective. The incentive part seems super necessary to me; it is dynamic, noble, fair that you make your product, but when one sees pathologies in the system, you say, good, you have to change it. Then you say how to change it? One says, for example, when I heard the Publindex changing of system, how hard is arguing, if not this I am wrong six years, it came out, and it seems that it is not known what will happen. It will be traumatic. I do not see it. We hope it applies and not throw it back, but nobody is happy, so what is the proposal? Professor Yury then says exciting, profound things, and his initiatives are always very nice, but how?

We have passed concerns ourselves. There is a follow-up group to decree 1279, and that group also developed agreements, which clarify and scope the legislation. All the administrative acts have taken around the legislation. The national phenomenon, in which the university reached (72) Journals, then happened to (42) and at this moment is as in (52). It is a phenomenon that has led to pathology. As you say, you have so many journals the researchers prefer to publish here because the process is much more comfortable. Get the points to jump to the whole international process. Could one explain the national phenomenon like that? Are there people who have internationalized? or does it depend? This phenomenon is natural, but I do not know if it can be explained in the way you say because it is still published a lot on the outside, and you know that there are partial indexing results right now in the cuts that have been made and it is catastrophic. Some that have been in A1 and have been several without category, almost half.

## Level 2, Researcher's and editors

Research in Pharmaceutical Chemistry "It depends on the researcher, there will be cases, and those are one of the severe criticisms that have been made of this decree. There are studies in which figures effectively show the increase in the number of journals, in the number of articles published by professors, mainly from the public universities, to whom the decree applies. Let's say it could be a mistake to turn that into a generalization. Besides, the other point has been the one that has been mentioned above. The comparison between



the areas of science, wherein principles, due to the global comments that come out worst left are those of the human and social sciences, because let's say that making soft sciences the comparison leading to reproducibility is limited in the human and social sciences”.

Research in History, “I believe that those who work in Exact Sciences are more attractive that kind of aid from the government or the universities. For the Social Sciences, it is simply hopeless from my perspective. I have done two PhDs, and each one has taken me several years. A Ph.D. can have 15 or 10 chapters, which are 15 or 10 papers. It is your work of many years, an article in Social Sciences may take one year or two to write, to find direct help with those topics that one writes of the universities I would say very little. Publishing is also challenging. Universities are not in the eagerness to publish. One tries very hard to collect 4 or 5 articles that become a book. When you have written the universities, you are not calling with great enthusiasm to publish and disclose your findings. First comes a job of persuasion, contacts or friendships that one has, I do not see great enthusiasm”.

Research in Pharmaceutical “Publindex that is not reality, the teachers are in a very comfortable metric, have to change this, that's not fair; also that's why they give salary points. The Publindex curve always said that we produced everything, but when we looked at it. We related it to the impact. It was zero, it told me a very nice analysis, fascinating everything, but that does not depend on us, I said. Still, the university has autonomy, and the university can decide that it does not go to Publindex. I regret to say that it does not depend on us. We are with a regime that comes from the Ministry. I regret to tell you that the Publindex does not depend on me but depends on Minciencias. We are wrong as University. He finds it necessary to rethink 1279, a new decree that necessarily adjusts to superior silver quality in 1444. To this day, we have it, but that 1444 necessarily. For that, 1279 necessarily has the same spirit, i. e., productivity vs. remuneration, and remuneration on a wage basis, not on a bonus if not on a wage basis, yes? So that's where the figures, from which a rationally productive professor because he has an attractive salary here, professors today at the Public University, in the Colombian public system that with 40 years old is easily earning more than 3 thousand dollars, forgives me more than 10,000 dollars

than that. Not in any part of the world, you find that even more so when you place \$10,000 in monthly remuneration, vs. \$250 miscounted for minimum wage”.

Research in Civil Engineering, “Is becoming perverse. You get a better salary because you have more points. I have enough points (And I say enough in the sense that I might not have them, I do not live at the University).

I send things for, score, in almost everything they put me zero. Interestingly, the Administrator has regulations that do not understand the expertise and specific knowledge of an area, only in requirement—first the subject of the points. But I give you my first reflection. And what about the teachers? With those who are simply extraordinary teachers?”

Editor in Social Science Faculty, “I think that it is necessary to reform it. For many years it has been asking for the reform of Decree 1279 to introduce improvements so that the machine is not working irregularly. The perception that I have is that if you look at the cronyism cases in which I evaluated you well. You consider me well, and let's go step by step. They occur less and less in high-level journals and continue to happen more and more in the journals indexed, primarily in provincial Journals. I would put a roof on it.

Editor in Biotechnology, “At the beginning of the 90's it appears decree 1494, that fundamentally what it does is stimulate the academic thing. It promotes the development of academic productivity and binds it to economic growth. Then, in a big way, one finds a salary stimulus that there is the academic product. The salary stimulus that does not become a bonus in private universities but becomes a salary base is that your permanent remuneration is already affected. The Colombian public system can find full-time professors between 4 and 5 million Colombian pesos exclusively. Even professors who are bordering today between 35 or 45 million Colombian pesos are one, a tremendous interval. Although nominally, some professors have better salaries than senators or ministers in this country, so that remains in attention, 1444 allowed the universities of the region to have the scoring committees”.

## **Tension 2. Epistemic Communities, autonomy in research agenda, and ethical misconduct.**

### *Tension 2.1 Epistemic communities*

#### Level 1 Directors

Research Vicerrector, “We must understand is that this is an integral chain; knowledge is a chain, there is no sufficiently solid applied knowledge produced. That is the famous tree of knowledge where the root is the basic knowledge; technological knowledge is the trunk; innovation knowledge is the branches. If I only have roots, I don't have fruits, but I have fruits from where they hang. I don't feed the roots. Not everyone in Minciencias has it. Let's say that in Minciencias, there are defenders of the model, and everyone talks about how the party is going. Still, a much more comprehensive view is required from the legislative bodies, let's say of the management and development of science, technology, and innovation.”

Director of Industrial Engineering, “If you look at the number of journals, there may not be enough space to publish in the national ones. But if you look at the number of international journals, there is an important number of journals where they can publish for all areas. If they manage to publish there because they will have space, there are more Basic Sciences journals than journals like Human Sciences or Arts. However, I also believe that there are areas in which they can publish their subjects.”

#### Level 2, Manager's

Academic Vicerrector, “The policy of scientific production is linked more to the engineering areas and the areas of science, basic sciences, and hard sciences than human and arts areas. Each area should have a different measurement model because each area behaves differently at the scientific production level. The policy has tried to standardize all areas, and not all areas are managed in the same way. We are very independent in that case for the issue of funding. For example, we do not tie it to groups for research projects. We do not put a line; we do not tie it to stairs; we do not tie it to any scientific production national

policy. We make our terms of reference with our policies, supporting and strengthening all areas of knowledge, taking into account the particularities in each area”.

Academic Vicerector Social Science Manager, “There are many factors that affect that. One is the dynamic of planned renewal of these bodies, right, because we move between tradition and the corporation of new developments. In that sense, management is the same thing that perhaps happens with the power of heritage, which affects universities, of course, of the immaterial they have to do with what they preserve. That change, all the time that is a difficult question to solve, but we must generate much more knowledge around it. How do I maintain my identity? How do I incorporate change without losing my identity? That's one of the very complex issues of intangible heritage “.

Incentives Office “The social sciences are making a more important contribution to local development and solving problems that are being done in the hard sciences but are not being penalized because it ends up being a social stratification.”

### Level 3, Researcher's

Research in Pharmaceutical Chemistry “Is a balance in terms of disciplines. The system's problem is that the basket has been put all the world in the same basket. He told me, all he cares about is that the Journal is visible. If it is small, it appears, and someone downloads the vital pdf, he does not look, does not look, the impact factor and what, and the only important thing for him is that it appears somewhere.

Research in History, “Universities or research organizations are measuring. Suppose you do not classify with an exact Sciences research schedule. In that case, your project is not long-lasting. It does not have a place in the community, so it is a challenging research situation in Social Sciences. It is not that one does not have the time, nor the desire, then that reconciliation between Social Sciences and Exact Sciences, in the applied part has indisputable social effects that part we do not look at very well, integrate those two fields, be more cordial and more generous in the intra-academic or intra-knowledge dialogue, more multiculturalism.

Civil Engineering, “World Risk Management Programmed so that all the projects made in the development of the countries; take into account the measures of prevention against disasters! The Europeans did not yet discuss that in their journals in their papers! I've always said that Risk Management is any risk! It's not just geo threats by climate change. Let's see, as in 2009, Norway said, why don't those two scientific communities come together and talk! Because we began to see that they had terminology for which we had another terminology; other conceptual frameworks”.

Editor in Social Science Faculty, “Sitting there in front is the director of the psychoanalysis Journal, who are psychoanalytically Lacanian psychoanalysts, then he restricts the field, he looks at that psychoanalytic journal it is a yearbook, he does not have the muscle to take a biannual Journal, but each yearbook that they take is a compilation of a specific topic of psychoanalysis in that Lacanian perspective, and that Journal is sold more abroad than in Colombia, it is sold more in Argentina, Mexico, and France than in Colombia, and has many citations, but the problem is that in the area of psychoanalysis in the world there are not many indexed and less Lacanian journals. Note that you can publish very high-level materials, but they will never enter the mainstream circuit. They are Journals that will never enter the Colombian index.”

Editor in Engineering, “One cannot ignore the humanities, their value, especially when the humanities have played a fundamental role in the visibility of the National University. For example, one of our most recognized recent rectors, Professor Guillermo Paramo, 'impressive. He's an anthropologist, doesn't write anything, doesn't write, but is one of the most visionary guys you can find. He's too valuable. This Victor Moncayo has her speech, has her way of seeing, but she has a lot of courage.

On the one hand, we haven't done it. So beyond the fact that it is difficult to reach a consensus, the discussion is not closed. At least opportunities are managed beyond the significant amount of resources is oriented to other things. That is something that seems to me that at least in the National University has given us a chance that it does not disappear, that it does not become invisible as it is done in some other spaces”.

Editor in Biotechnology “The problem that Minciencias has not yet solved is asymmetry, heterogeneity, and inequity in the knowledge of the different types of knowledge according to the discipline. The underlying model is that of Basic Sciences, and I'm telling you this because my doctorate is in Basic Sciences, but I also work with social sciences, with people who work in basic sciences. Where does that reflect? Simple. That is a great heel of rent of the national system of this country. In that case, Minciencias has not solved this Gordian knot because, besides, a great part of this type of discussion is manipulating and not even directed. The basic sciences that have turned their backs on the country for a long time are manipulated by a very orthodox, some people live in another world, the great majority of which is the little problem”.

## **Tension of 2.2. Autonomy in the research agenda, mainstream no mainstream knowledge**

The challenges are the identification of research agendas concerning public vs. private autonomy.

### **Level 1, Director**

Research Vicerrector “That's right. The university tried to defend itself from seeing if I could reach the knowledge agendas to show through a mechanism I call knowledge agendas. It is a look from the university to see what issues it was interested in moving. The construction of this agenda was conceived from a missionary perspective. These were spaces of collective construction and articulation and visions of the future that integrate the capacity of science, technology, and innovation of the National University of Colombia to specific fields of interest for development and the best state of contemporary society. We are not thinking in rankings.”

### **Level 2, Manager's**

Academic Vicerrector “The policy of scientific production is more linked to engineering and the areas of science, of basic science, of hard science, than linked to the areas of humanities and the arts. There, invisible schools and epistemic communities have been

unknown because their process and dynamics have not been historically considered; in other words, they did not review what type of production they were handling. They did not review what their measurement processes were. In other words, for each area, there should be a different measurement model because each area behaves differently at the level of scientific production, and policy has tried to standardize all areas, and not all areas are handled in the same way”.

Academic Vicerector Social Science Manager, “Evaluation practices have led to different models of metric indicators leading to pathological behaviour. Strategies are used to cite or increase their citations or create cronyism or clans on the one hand but also to develop a series of businesses.”

### Level 3, Researcher's

Research in Pharmaceutical Chemistry “Well, it seems to me that the premise suddenly, the latter is not entirely correct. The system is not the one that defines who gets people to publish in local journals. That depends on the researcher. The only time, let's say that these policies have led to its publication in national journals. Then, suddenly, visualized in terms of the fact that it is easier to publish here, and therefore when it comes to recognition, either by categories of Journal or by the scores assigned by public universities.”

Research in History, “I am a friend of those who run libraries in the universities of Colombia, and there is an interesting statistic, the people who visit libraries the least are called deans. In any university, the deans who use knowledge the most are the deans or the rectors. If those who lead knowledge have never written or researched anything, as they can say if research work is serious or not serious, returning to my case, I think that people who have a very superficial vision that they have finished.”

Research in Pharmaceutical, “Let's take advantage of all the platforms we have and look at where the strength of scientific production. The information of the scienti with all the defects that we had is a treasure trove of information that must be purged because we researchers are cheats”.

But we changed one significant thing. Research in Civil Engineering, “For example, I came to the IPCC (Intergovernmental Panel on Climate Change) and gave them a headache because I told them that the most well-published information on risk management in the world was not in the northern hemisphere Journals or English, they told me that “that was grey literature” and I said, “Okay, let’s see who has the best literature inside.” They wouldn’t accept it! And from a report we made in 2012 and then in 2014, it is already taken under that rather unfortunate, pejorative name as grey literature. Finally, however, they received a mechanism for the grey literature to enter the IPCC.”

Editor in Social Science Faculty, “I believe that a mixed phenomenon is going to happen. It depends on the area of knowledge of each research group. For example, in the faculty of science, in the Colombian Journal of Physics, this one of the most cited Colombian scientific articles in all of Colombia, is an article of theoretical physics, and is at the frontier of science, is that whoever wrote it was Deputy Director of the Shendar in Europe which is the frontier of science.

Now that it is happening with a Journal that is providing technological solutions for the Colombian agricultural sector. A system of disinfection of the cape gooseberry avoids such a fungus. The product’s obsolescence losses and lifetime improve further as it reaches international markets that do not matter to anyone globally. Still, it can have a powerful impact on the productive system and the generation of profits, and we are talking about science, I am talking about science. An article that was published in an anthropology Journal here on the rituality of training child combatants in the Farc-ep, a whole rituality where they are first put to march with wooden guns, all the children, 12, 13, and 14 years old who were captured, they are subjected to some rituality’s on some fronts, that was the object of an anthropological investigation, and the article was published, tell me what incidence this will have”.

Editor in Engineering “Yes, and there’s a little something you can say, I have the tip of the iceberg, and I can be well under the water and well away, and what I’m trying to do is send a hook-up, but I want to see where I am. So, what am I going to do if the hook doesn’t reach



me? Am I going to let myself drown? My job is to climb to the tip of the iceberg with 10 million people behind me, or maybe I have to modify things, get an air tank, learn to swim, and live under the water to see when I climb up and make my island? Or is it my goal to reach the tip of the iceberg? I don't know what's my end. I'm here, okay? So, well, if I ask myself that, then I should first ask myself what others have done and where I want to go”.

*Tension 2.3 Ethical misconduct (Publish or perish). Predator behaviour*

Level 1, Director

Research Vicerrector, “All the universities in the world are trapped in that kind of created mechanism. In which we produce research, pay for publication, and then buy our knowledge. It is a crazy and costly thing. This university has spent the budget of the vicerrectory 30% going to databases. That is knowledge produced by other universities, we pay for knowledge, and the universities pay because we produce, and in the end, who wins? The middleman, the great and all of them, basically Elsevier, has been getting bigger and bigger. It seemed to have no way out of this process because we always looked for the most advanced article to avoid repeating the research and cite. So we have to devise a mechanism by proposing networks of universities that begin to publish from the outside and achieve and share without paying those who publish us, right? It's also a business, publishing an article in a top journal, it can cost you 30,000 dollars a crazy amount to publish it, from the moment you start looking for the mechanism, they give you advice, make you a style correction, put you, evaluators, end up paying some figures. Still, a standard Journal pays 3,000 dollars. They are crazy things that happen to us. It's also a business, publishing an article in a top journal, it can cost you 30,000 dollars a crazy amount to publish it, from the moment you start looking for the mechanism, they give you advice, make you a style correction, put your evaluators, end up paying some figures. Still, a normal Journal pays 3,000 dollars. They are crazy things that happen to us”.

Director Industrial Engineering, “We know, as a rule, always check that the work that comes in has not been published by a similar version or with a similar title. We have that tradition, and we have it because things have happened to us. I am not saying that it is the generality, but we found one or two cases. So we have to tell the teacher that there is a very similar

article for which he was already recognized score and that consequently he will not be recognized for the publication.”

### Level 2, Manager's

Academic Vicerrector “Also, in this case, there are several aspects to this statement, aren't there? The other case is the researchers who publish without quality and those who already have all the ethical misconduct at 100 percent. Still, more than the lack to publish from our researchers that he has that problem, it seems that with the few of us who have the ethical problem, that is more than a pathological problem. They are ethical problems, and an ethical problem does not come overnight. An ethical problem is from home; ethics is taught in the home. So, I think this is cultural: ethics, as we talked about in the ethics committee. At the Public University, we have to have some scientific integrity principles that are not detailed and not declared ethical principles. What have we been thinking about since the ethics committee? To generate a code of minimum principles of scientific integrity. The Decalogue of Ethical Principles generates a culture of ethics in research at the Public University to carry out ethics training. You are talking about all this stuff about recycles, about salami, about suppliers. These are honest mistakes. All right, it affects an institution's reputation, but I'm not killing people for it. When I compromise my ethics, I have a much greater affectation”.

Incentives Office, “There may also be professors who are the point, the point, and with that, they have their results, because they are good because they have elements. Others are very refried because they also see the same subject and text in several products. But there are also professors who I think are a scheme of those who publish but are more interested in strengthening their area of knowledge. As I told you, the indicator and the incentive is already a result, not an end”.

### Level 3, Researcher's

Research in History, “I believe should not be included these practices in our models, now there is a program in the computer that detects very easily if one is impersonating some sentences of another author or not. I've seen one of those programs. They're not as rigorous

as they are because after I'm in the cloud, I say 100% copyable, and it's that I self-copy myself because the model is not very well invented. I read the article, and I've been reading it for fifty years permanently. I'm interested in certain things like what the author has also written, what contributions he brings me, what new things he tells me, what new things he tells me. I don't see him as scientific. For example, if they discovered new penicillin, that type of research doesn't seduce me so much. It attracts me more if he has discovered new ways of thinking. It attracts my attention a lot of attention, new interpretations of reality, etc.”.

Research in Pharmaceutical, “I have to do this with the editors, all were sectorized, and people already had their minds that was going to be the same with the research groups. The research groups were telling lies that reported 600.000 invented data. Only the articles find thousands of data that did not correspond but 600 false data. All of this has to do with the same thing the scientists know that Science is not the Pharmacy Journal level, and even so, they fight. After all, they lose their status because they lose the salary product because poor little ones we are in charge of degenerating in some way”.

Research Civil Engineering “The professors have every right, but they are involved in something challenging, have no possibilities, have no alternative and what we universities have. Ow, much can they pay a professor? How much is the maximum amount you can receive per month? They're taking his body out to publish internationally because they're not doing well in international publications, so something exciting has happened! You can't imagine the importance of points that have become national Journals! So much so that you even get more points than a well-ranked international in the indexes! Then it is becoming a mafia, and everyone is already saying No! It's just that man I have to publish in the Journal here that gives me more points, it's in Spanish and what does it matter that nobody reads it?!”; when he appreciated the H Index. Then, they started to say [at the university] last year that they will apply the H Index to measure what teachers do here, no, that's the worst news for, that, I can assure you of one thing. In the systems already in place in developed countries, they have no doubt! It's not even a matter of political concern.

Editor in Social Science Faculty, “I believe that they occur for two reasons. First, for the researcher's ethical formation, those plagiarism cases and cronyism appear more with the older researchers. The new doctorates that arrive here of 35 or 40 years, the great brooms that arrive sweeping super well are impervious to this cronyism. They come better formed at an ethical level.

Second, the pressures of publication by professors, research groups, the same publication goals, and even the salary factors. You know that in many public and private universities, there are salary points for publication. Hence, all these are conditions that sometimes threaten scientific quality. There is a severe problem with the Brazilians, so it became obligatory to run the anti-plagiarism software to accept it. We fought so that the Vice-Rector of Research would buy enough licenses for all the faculties because we have a severe problem, especially with our beloved Latin American colleagues, the most dangerous of all Brazilians, in the area of biology, in the area of geography, is that they translate it into Spanish, they change subtitles. Still, it's the same. You know how you catch it by the dates because they have a system very similar to ours of points, then everything that comes from country universities and that, batteries, I always say pick it up with tweezers and first submerge it. We have recently had 6, 7, 8 cases of plagiarism in the different Journals of the faculty”.

Research in Engineering “First of all, it is valid to reflect on ethics in terms of publication and how one operates in the institution. There have been several cases in public institutions. There have even been a couple of cases here at the university. I don't have them well documented, but I know that there have been tough questions about ethics in publishing; in other situations, yes? The most recent case I know from 15 articles in a brochure that they took out in a Cuban Journal, the only one that did not co-author a professor from the university was in the publishing house. One says, how is it possible that 15 articles have the same author in a Journal and that this reaches a scoring committee? There are more aberrant pathologies, and I liked that term because I thought the pathologies were pretty beautiful.

Research in Biotechnology “If there is a considerable interval or teachers who repeat the same content, turning it into an umbrella in different places, publish it in English, post it in Portuguese, post it in Colombia, post it in a congress, right? Congresses give bonuses, articles give. So necessarily in Colombia, academic development, the dissemination of research results, all the scientific exercises are currently permeated by the issue of remuneration in Colombia; if one does not put a discussion or an interpretation or something that reorients the academic practice. If you don't put parole in 1274 and 1479, many things are not going to change. Yes, because the dissemination of knowledge is powerfully, clearly, when you speak of academics immediately, the martyrs of impunity appear. "no, no, but how so? Is that impossible? Are you talking about something that isn't true? We're genuine. That's what happens to you. Everyone starts to do very neat, dignified, bone, very bad-toned speeches, very even ethical. Still, when you look at the scoring committees, what's going on, then you look at what hurts people, how those scoring machines increase, yes? The vast majority of the academic community in this country, of all disciplines, are heavily contaminated because it is impossible for you, every time you receive this salary, not to realize that it is impossible, yes? The theme of sustainability, there is a document that was published through social networks, which announced that the public university two years ago had an operating deficit that rented the salary share of 4 billion, two years ago it was 6 billion, this year it was 48 billion, it is estimated then for next year it will be 125 billion.

Annex 16. Cartoon Scientific Publishing



Source: Mamados de Minciencias.





*El anillo es una promesa de poder que nos seduce pero nos hace esclavos de un amo que está atrás*



Source: Redalyc





## Annex 17. Vocabulary term list

Article Processing Charge APC: Are one-time payments for authors to cover the costs of peer review administration and management, professional production of articles in PDF and other formats, and dissemination of published articles in various venues, in addition to other publishing functions. There are no charges for rejected articles, no submission charges, and surcharges based on the length of an article, figures, or supplementary data. In addition, items (Editorials, Corrections, Addendums, Retractions, Comments, etc.) are published free of charge” (MDPI, n.d.).

Epistemic communities are “is a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area.”

Evaluation mechanisms: According to Cabinet: "Evaluation is the process of checking, after a program or project, to what extent and how the objective has been achieved. The scope and timing of an evaluation must be considered during the assessment so that the follow-up can gather the necessary information" (1989, p. 66). Evaluation mechanisms of research and scientific output define the patterns and behaviour of actors within a system. "Professional evaluation has taken on a key role in analyzing and legitimizing policy measures and science policy governance. Evaluation has to assess measures transparently and objectively, distinguishing ‘good’ from ‘bad’ measures” (Kuhlmann, 2016).

Indicators: RAE "That indicates or serves to indicate." Indicators define "a measure of measurable output or performance" (Cabinet, 1989, p. 67). For example, the number of citations received indicates research, but it does not represent the whole picture.

Incentives: According to the Cambridge Dictionary, incentives define "something that encourages a person to do something." Incentives shape behaviour; as mentioned:

Economics is composed of highly generalizable frameworks designed to analyze how incentives affect decision-makers in pursuing goals. Most higher education policies represent elements of incentive structures - or changes in those incentive structures - that influence the behaviour of individuals or institutions. This is very important for higher education policy analysis, as countless higher education policies can easily be conceptualized as tangible or intangible elements of incentive structures. Economics provides productive analytical frameworks for understanding, assessing, and measuring the effectiveness of such policies. (Smart, 2008, p. 2)

Moral hazard: "As economist Paul Krugman states, moral hazard refers to any situation in which one person decides how much risk to take, while another bears the cost of things going wrong" ("Riesgo moral," n.d.; Krugman & Wells, 2006).

Numerous economic studies have examined the effects of moral hazard on workers' compensation. Many of these have focused on the alleged propensity of workers to be less cautious or to file more claims to increase workers' compensation benefits. While many authorities insist that moral hazard is a value-neutral concept, there are often pejorative connotations associated with contemporary debates about the moral hazard that, intentionally or unintentionally, belittle workers' motives and undermine public support for workers' compensation programs (Dembe & Boden, 2000).

Research misconduct: "research misconduct includes invention (the fabrication of results), falsification (the manipulation of processes and results) and plagiarism (the theft of the work of others)" (Ana et al., 2013, p. 2). The US government has a long and specific definition of research misconduct, while the Europeans have opted for shorter and more general definitions. For example, a recent joint meeting of the BMJ and the Committee on Publication Ethics (COPE) reaffirmed an earlier definition of research misconduct as "behaviour by a researcher, intentional or unintentional, that does not meet ethical and scientific standards."

Plan S is an initiative for Open Access publishing that was launched in September 2018. The plan is supported by coalition S, an international consortium of research funding and performing organizations. Plan S requires that, from 2021, scientific publications that result

from research funded by public grants must be published in compliant Open Access journals or platforms. <https://www.coalition-s.org/>.

Predatory practices: There is literature on bad practices, so-called predatory practices in the academic and scientific community, and attempts to reduce them. The term predatory publishing is defined (O'Donnell, 2017) "as an opportunistic publishing venue that exploits the scholarly need to publish but offers a little reward to those who use its services." "Incentives granted to researchers by universities or funding agencies appear to have a direct impact on the perpetuation of unethical or bad Science practices, such as incentives based on the number of publications rather than their quality" ("Incentive malus," 2016). Publish or perish is an aphorism describing the pressure to publish academic work to succeed in an academic career. Such institutional pressure is generally most substantial at research universities. Some researchers have identified the publish or perish environment as a contributing factor to the replication crisis" (Wikipedia, n.d.).

Responsible Research Assessment (RRA) "how to create a healthy working culture for researchers, how to promote research integrity, how to move from closed to open knowledge and how to embed the principles of equality, diversity, and inclusion across the research community. Shifting the reliance on metrics towards more qualitative or mixed methods modes of evaluation."

Research Misconduct is defined as "Everybody agrees that research misconduct includes fabrication (making up results), falsification (manipulating processes and results), and plagiarism (stealing other's work). The US government has a long and specific definition of research misconduct, whereas Europeans have opted for shorter, general definitions. For example, a recent joint meeting of BMJ and the Committee on Publication Ethics (COPE) reaffirmed an earlier definition of research misconduct as "Behaviour by a researcher, intentional or not, that falls short of good ethical and scientific standards" (Ana et al., 2013, p. 2).

Scientific communities (Kornfeld & Hewitt, 1981) define “a diverse network of interacting scientists.” It includes many "sub-communities" working on particular scientific fields and within particular institutions; interdisciplinary and cross-institutional activities are also significant.

Social trap or tragedy of the commons: Describes a situation in which several individuals, motivated solely by self-interest and acting independently but rationally, end up destroying a limited shared resource (the commons) even though none of them, either as individuals or as a whole, is convinced that such destruction will occur "The tragedy of the commons is implicated in population problems in another way."

University Research Governance: Leisyte (2007) defines university research governance as "Institutional arrangements within universities (e.g., lines of authority, decision-making processes, financing, and staffing)," which depends on external governance that "refers to the institutional arrangements on the macro- or system-level (e.g., laws and decrees, funding arrangements, evaluations)" to define new research agendas and strategies (p. 23).

**UNIVERSITY RESEARCH GOVERNANCE AND THE COLOMBIAN  
SCIENTIFIC JOURNAL INDEX "PUBLINDEX."  
UNDERSTANDING THE TENSIONS**

*María Alejandra Tejada-Gómez*

Public defence will take place on Friday 13 May 2022 at 12.45h.