

Appendix B: Luxembourg Research Institute Evaluation 2022: Mapping of Knowledge Structure: Department internal

Daniel S. Hain

23 August, 2022

Contents

1	Introduction: LIST Department MRT	1
1.1	Purpose & Structure	1
1.2	Further resources	2
2	Topic modelling	2
2.1	Topic Development	2
2.2	Topic Ranking	2
3	Knowledge Bases: Co-Citation network analysis	3
3.1	Knowledge Base development	3
4	Research Areas: Bibliographic coupling analysis	4
4.1	Research Area Development	4
4.2	Research Area Similarity	4
5	Knowledge Bases, Research Areas & Topics Interaction	5
5.1	Joint Overview over Knowledge Bases, Research Areas, and Topics	5
6	Collaboration	6
6.1	Collaboration network 2nd Degree	6
7	Missing Publications	7
7.1	By Reason	7
7.2	By Type	7
7.3	By outlet (Journal articles only)	7

1 Introduction: LIST Department MRT

1.1 Purpose & Structure

This document provides additional analysis and visualizations regarding the Luxembourg Research Institute Evaluation 2022 of LIST Department MRT. Its purpose is:

- To map the broader research community and distinct research field the department contributes to.
- Identify core knowledge bases, research areas trends and topics.
- Highlight the positioning of the department within this dynamics.

It is structured as follows:

1. **Topics:** Further information regarding the departments research topics and their development

2. **Knowledge Bases:** Further information regarding the departments knowledge bases and their development
3. **Research Areas:** Further information regarding the departments research areas and their development
4. **KB-RA-TP interaction:** Joint visualization of knowledge bases, research areas, and topics.
5. **Specialization:** Departments research area and topic specialization compared to the broader research field.
6. **Collaboration:** Co-Authorship networks to other research institutions.
7. **TEchnical description:** Further guidance regarding concepts, methods, indicators, techniques, and workflows.

1.2 Further resources

This document and further factlitating information can be found online under:

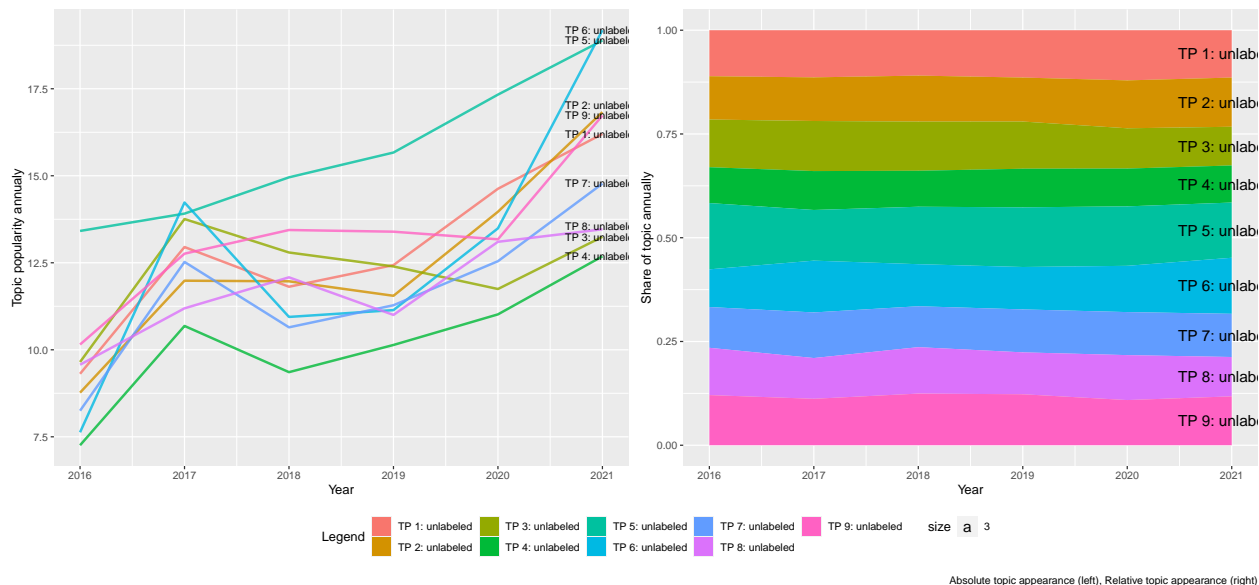
- This document: https://daniel-hain.github.io/biblio_lux_2022/output/field_mapping/field_mapping_list_mrt.html
- Mapping of broad research field: https://daniel-hain.github.io/field_mapping/biblio_lux_2022/output/field_mapping_dept_list_mrt.html
- Interactive Topic Modelling: https://daniel-hain.github.io/biblio_lux_2022/output/topic_modelling/LDAviz_list_mrt.rds/index.html#topic=1&lambda=0.60&term=
- The method for the research-field-mapping can be reviewed here: Rakas, M., & Hain, D. S. (2019). The state of innovation system research: What happens beneath the surface?. Research Policy, 48(9), 103787.

2 Topic modelling

2.1 Topic Development

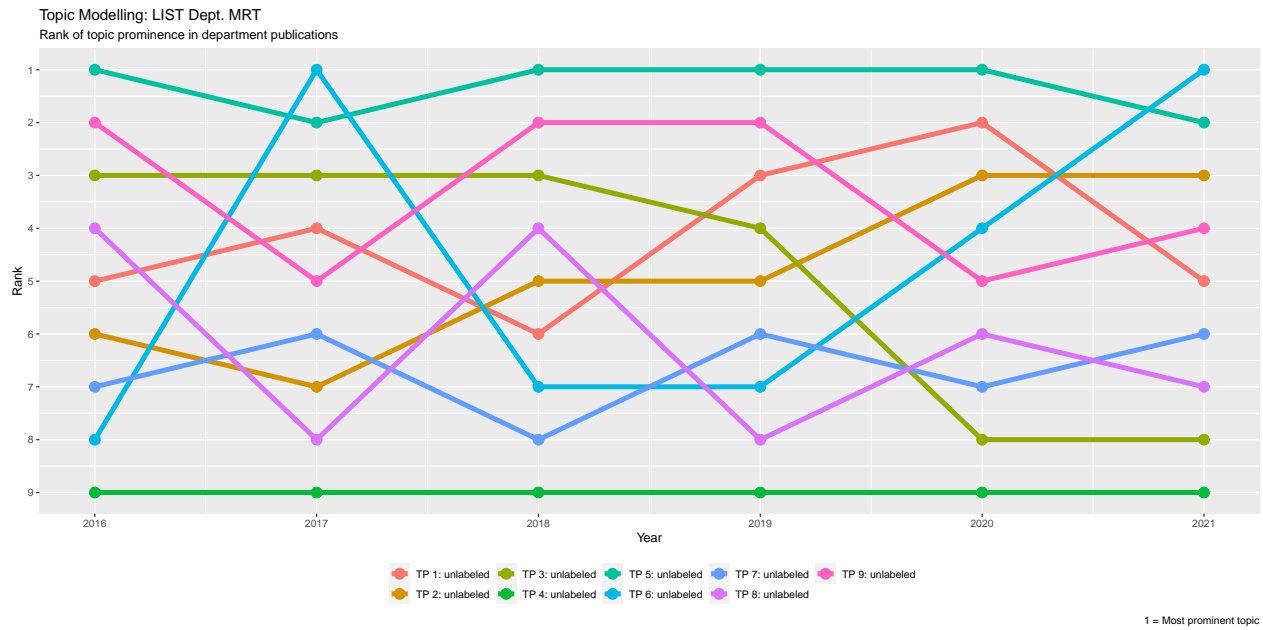
Shows changes in topical focus of the department over time.

Topic Modelling: Research Field of LIST Dept. MRT
Timeframe: 2016 – 2021



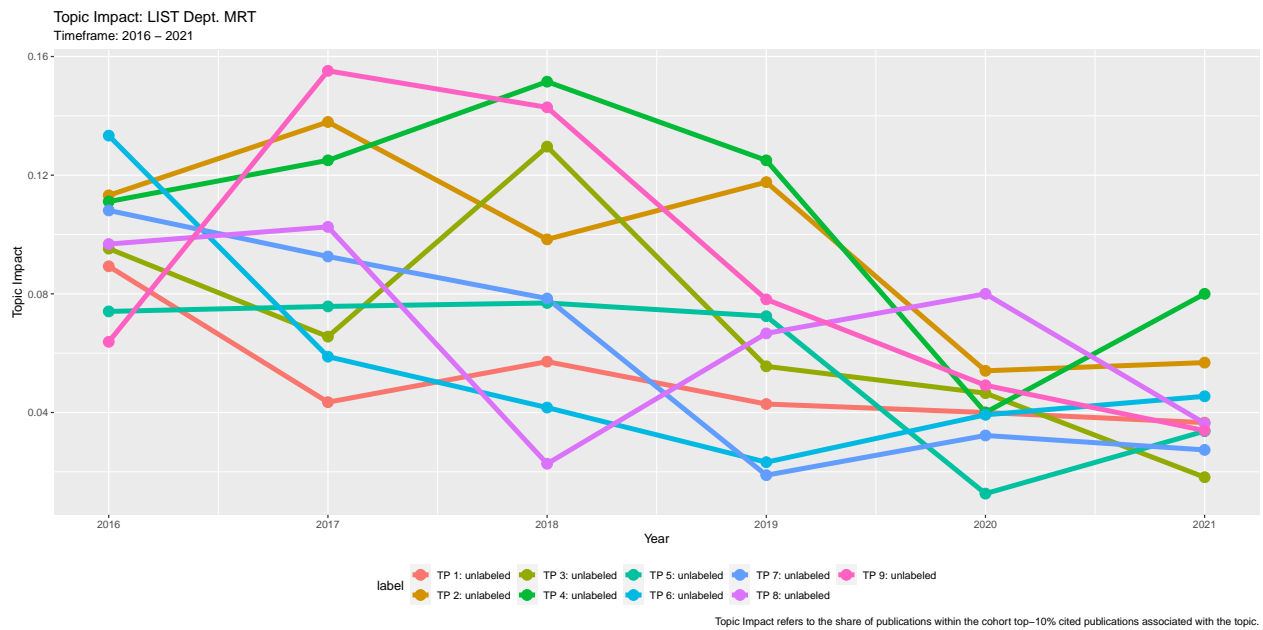
2.2 Topic Ranking

Shows changes in topical focus of the department over time (ranking).



Topic Impact

Shows which topics were particularly impactful (cohort citation percentile) over time.

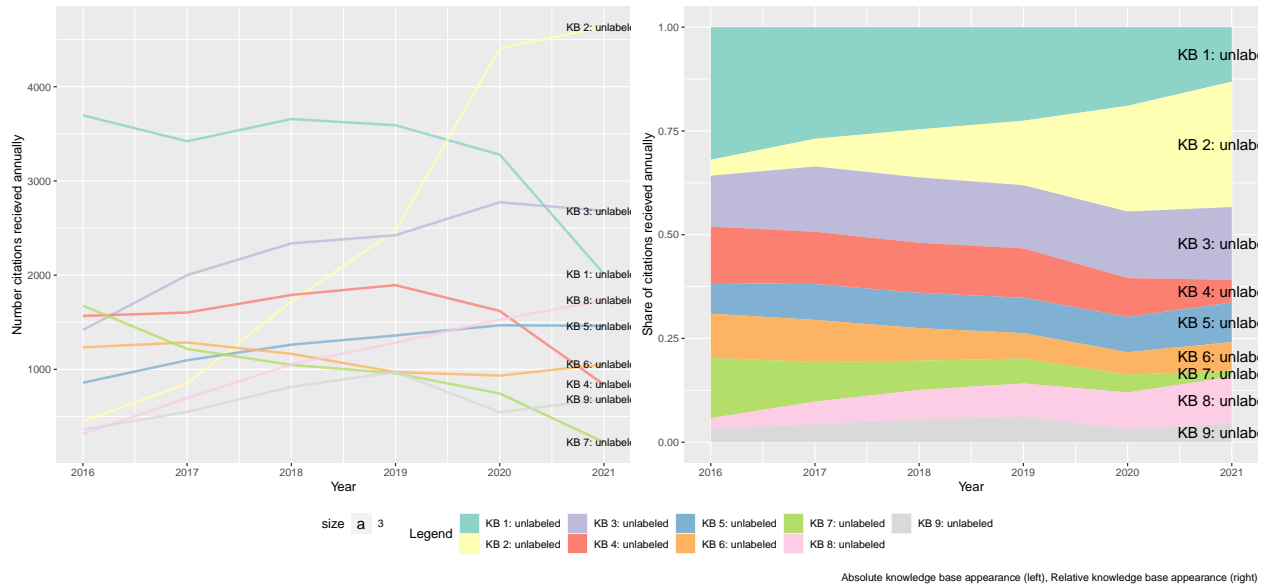


3 Knowledge Bases: Co-Citation network analysis

3.1 Knowledge Base development

Shows the development of citations to the knowledge bases by department publications.

Knowledge Bases: LIST Dept. MRT
Timeframe: 2016 – 2021

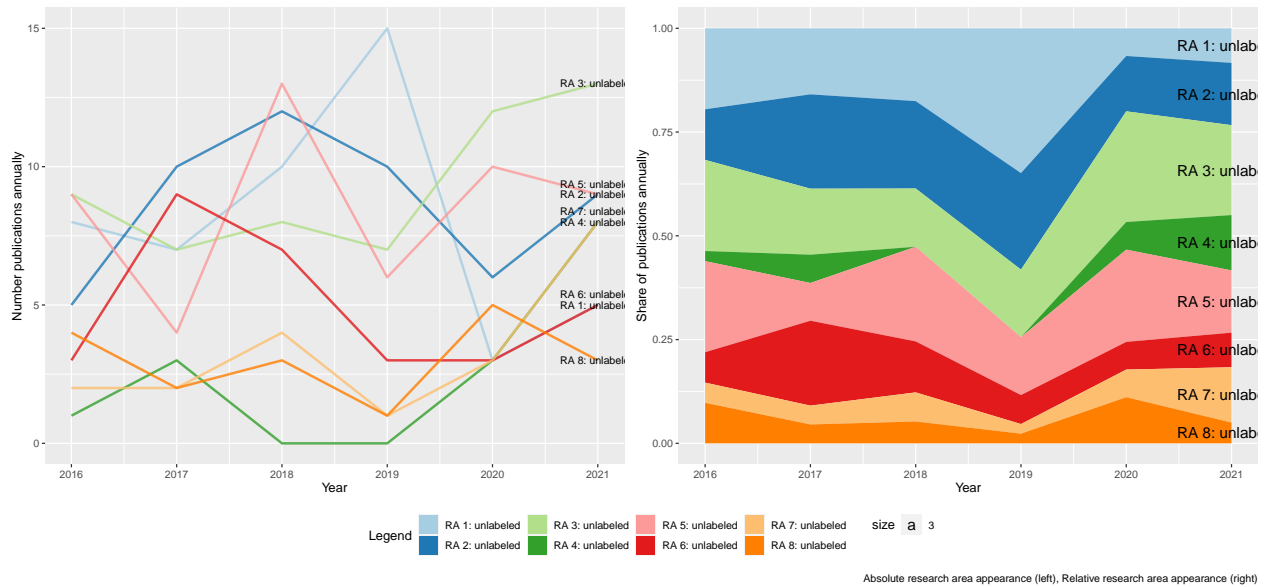


4 Research Areas: Bibliographic coupling analysis

4.1 Research Area Development

Shows development of department publications in the research areas over time.

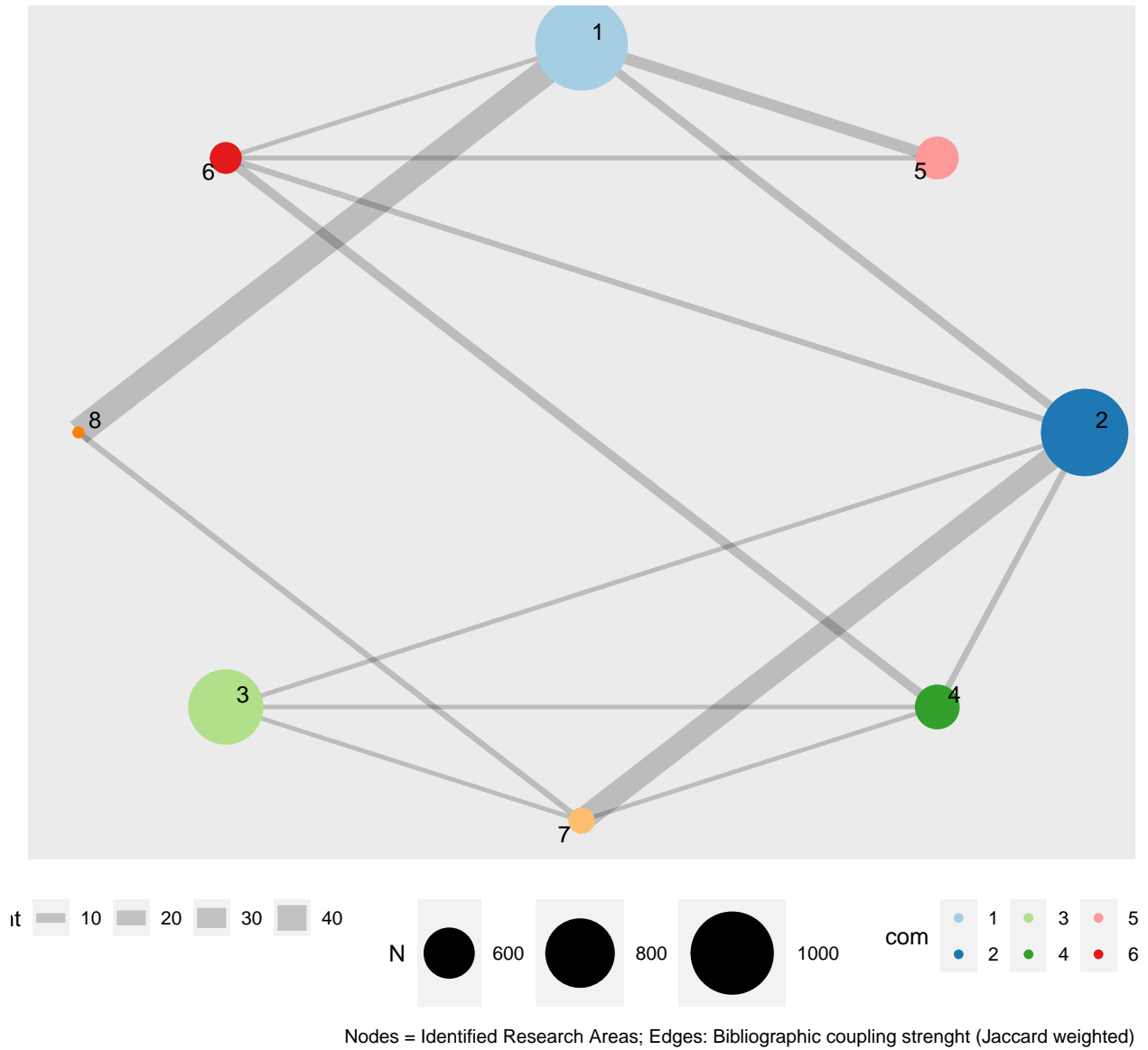
Research Areas: LIST Dept. MRT
Timeframe: 2016 – 2021



4.2 Research Area Similarity

Shows the similarity of the departments research areas (by bibliographic coupling strenght).

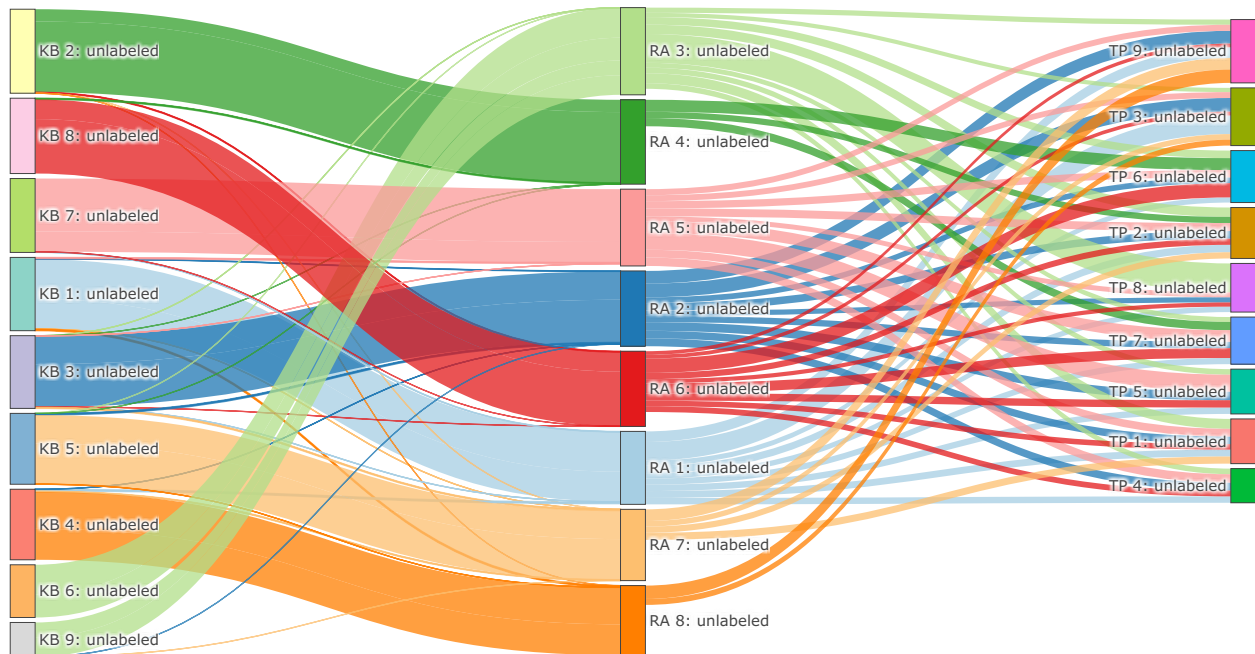
Research Area Similarity: LIST Dept. MRT
Timeframe: 2016 – 2021



5 Knowledge Bases, Research Areas & Topics Interaction

5.1 Joint Overview over Knowledge Bases, Research Areas, and Topics

This plot shows the connection of publications in the research areas to knowledge bases (by citations) and topics (by gamma, document-topic weight)



6 Collaboration

6.1 Collaboration network 2nd Degree

Shows overl collaboration (co-authorship) structure of the department.

