Who defines Professional Standards and which Indicators are Used in Bibliometric Research Evaluation?

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BibPro: Research Evaluation in Transition: The Institutionalization of Bibliometrics as a Research Field and Professionalization as an Expert Field

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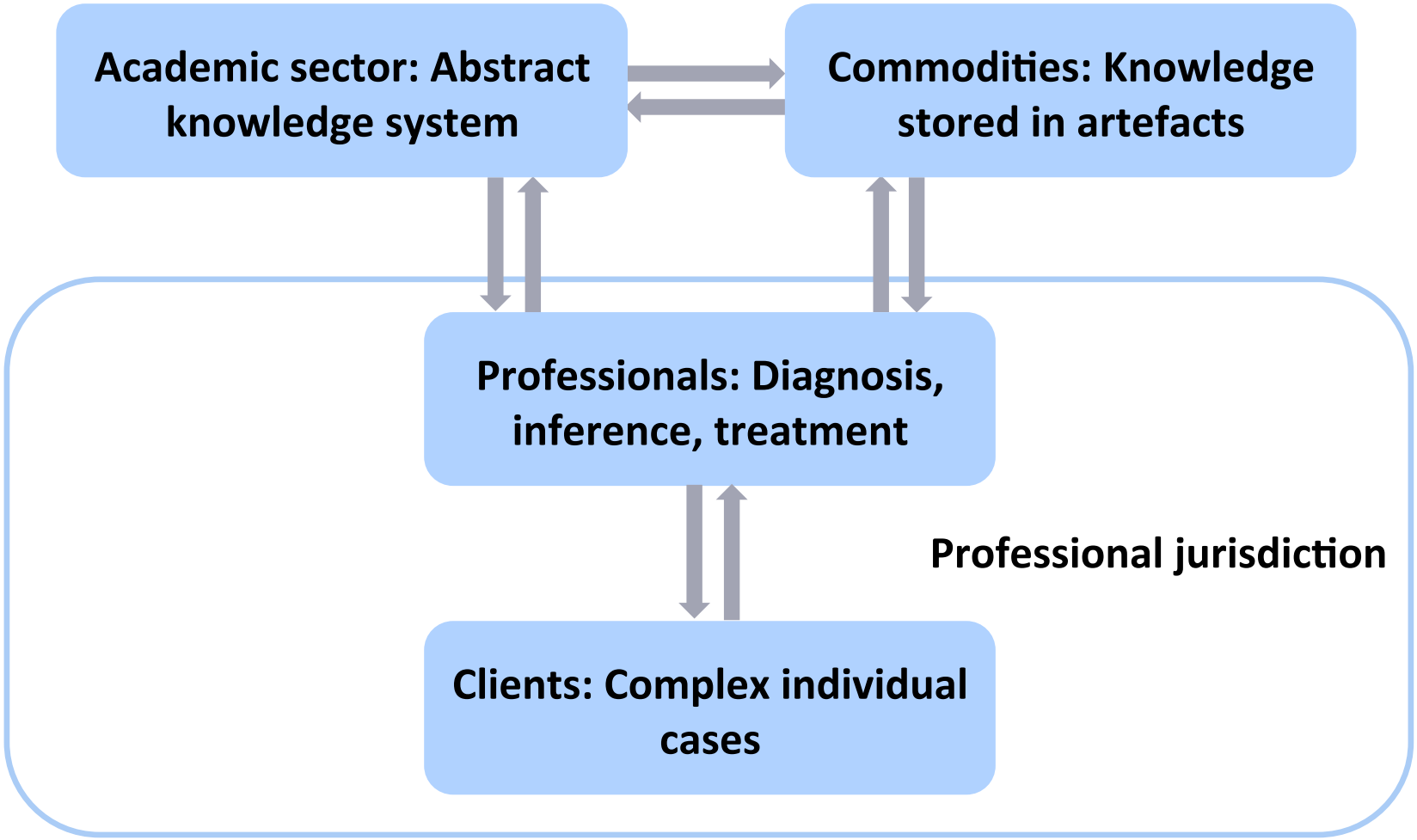
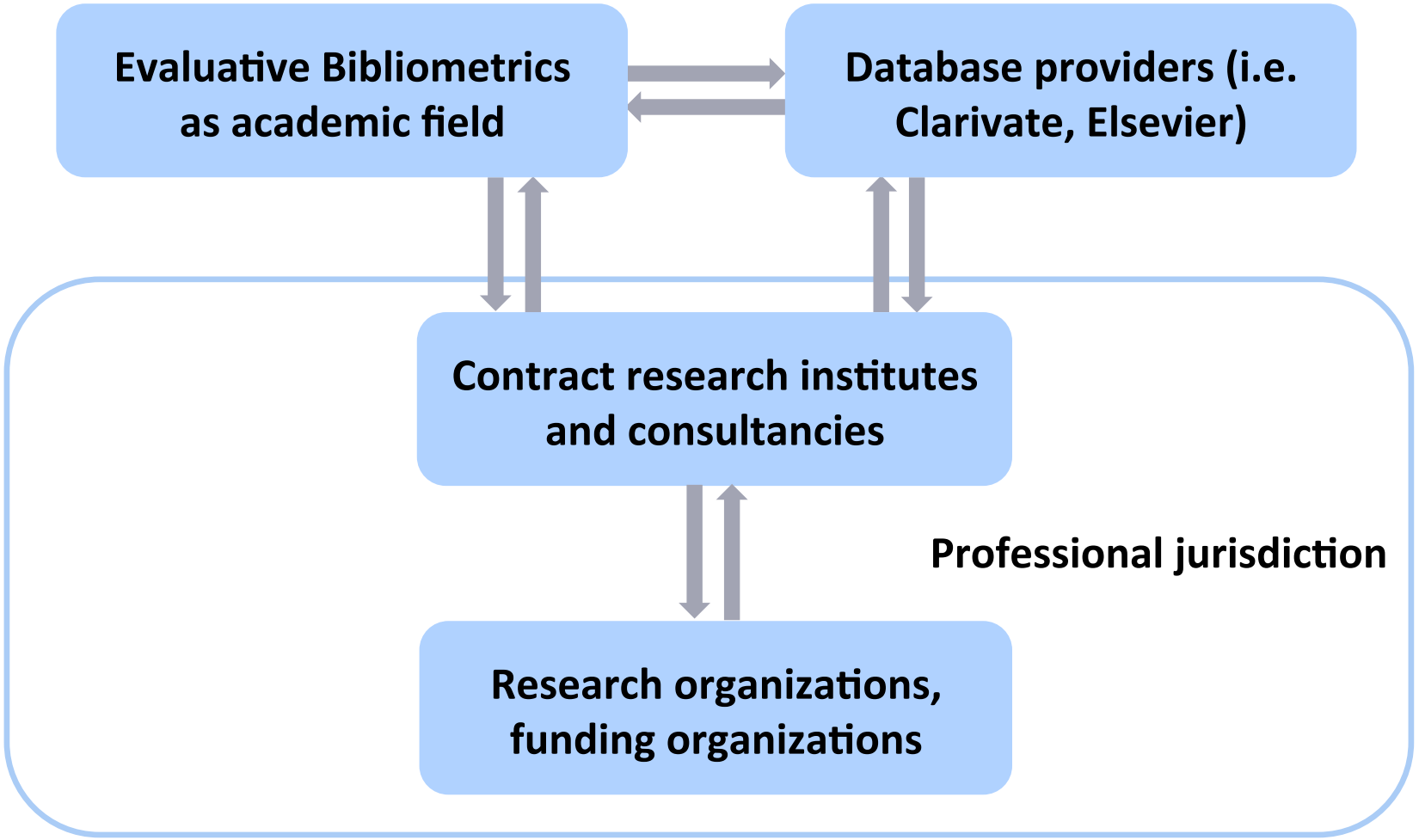
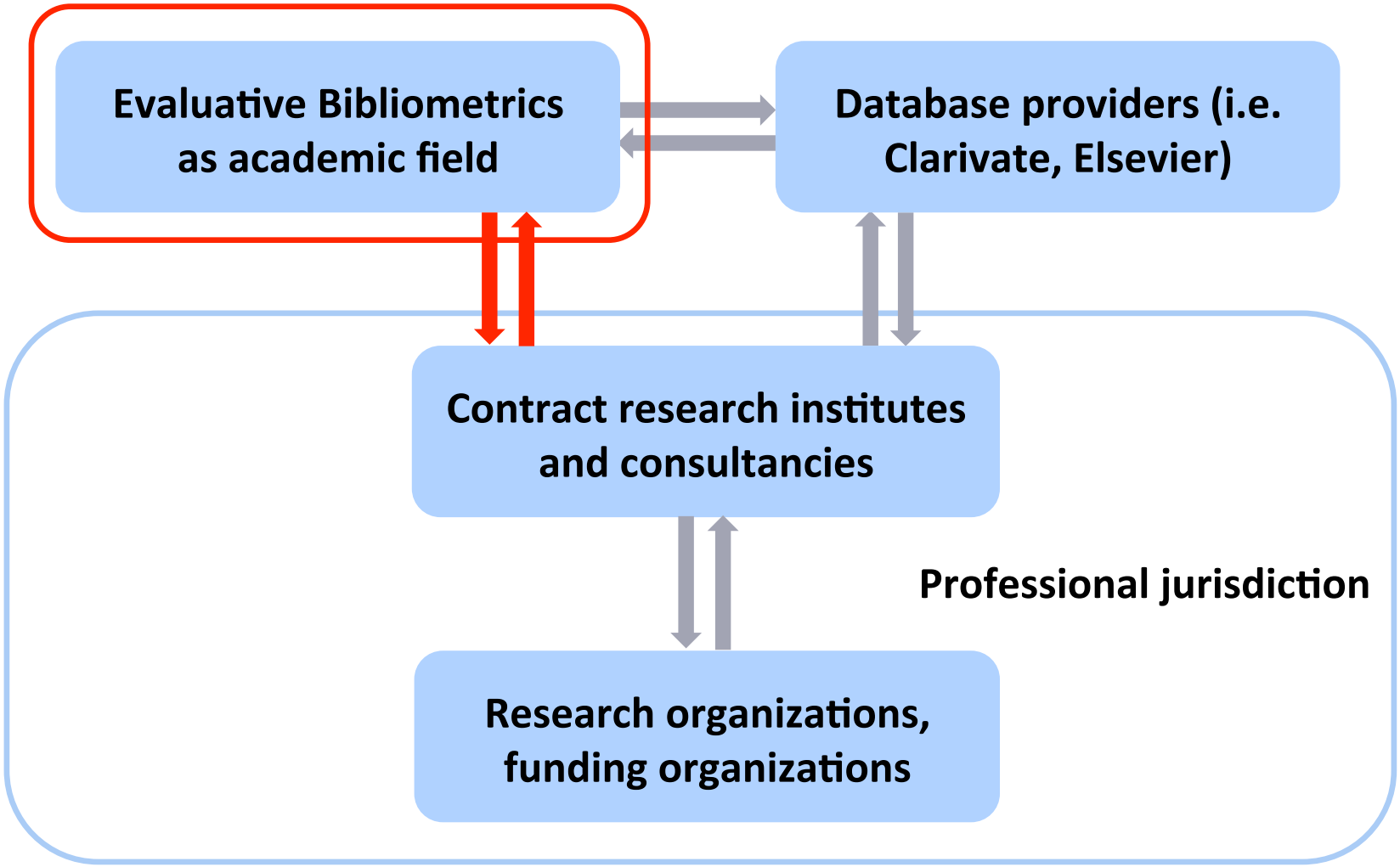
1.1 Professional jurisdiction (Abbott 1988)



1.2 Evaluative bibliometrics as profession



RQ1: Which indicators have been developed?



2.1 IF and HI: two influential impact metrics

- Journal impact factor IF (Garfield, 1972)

  Definition IF: the number of citations in a given year (T) received by all documents that were published in a given journal (J) during the preceding two years (T-1 and T-2), divided by the number of citable documents published in J during the years T-1 and T-2 (Moed, 2005: 92).

- Hirsch-Index HI (Hirsch, 2005)

  Definition HI: A scientist has index h if h of his or her N_p papers have at least h citations each and the other (N_p-h) papers have ≤h citations each. N_p is the number of papers over n years, (p. 16569).

2.1 Citation indicators as follow-up inventions

- Follow-up inventions elaborate on, differentiate or improve an original contribution. They diversify the stream of research that goes back to a single pathbreaking idea.

- Selection of IF-related citation indicators:

  Reviews by Todeschini & Baccini (2016); Waltman (2016); Mingers & Leydesdorff (2015); Fragkiadaki & Evangelidis (2014); Glänzel & Moed (2002); Schubert & Braun (1996); Todorov & Glänzel (1988); Vinkler (1987); plus several research articles.

- Selection of HI-related citation indicators:

  Reviews by Todeschini & Baccini (2016); Fragkiadaki & Evangelidis (2014); Wildgaard, Schneider, Larsen (2014); Liu et al. (2013); Egghe, L. (2010); Norris & Oppenheim (2010); Schreiber (2010); Alonso et al. (2009); and Guns and Rousseau (2009); plus several research articles.

2.1 Citation frequencies for 74 IF-related indicators

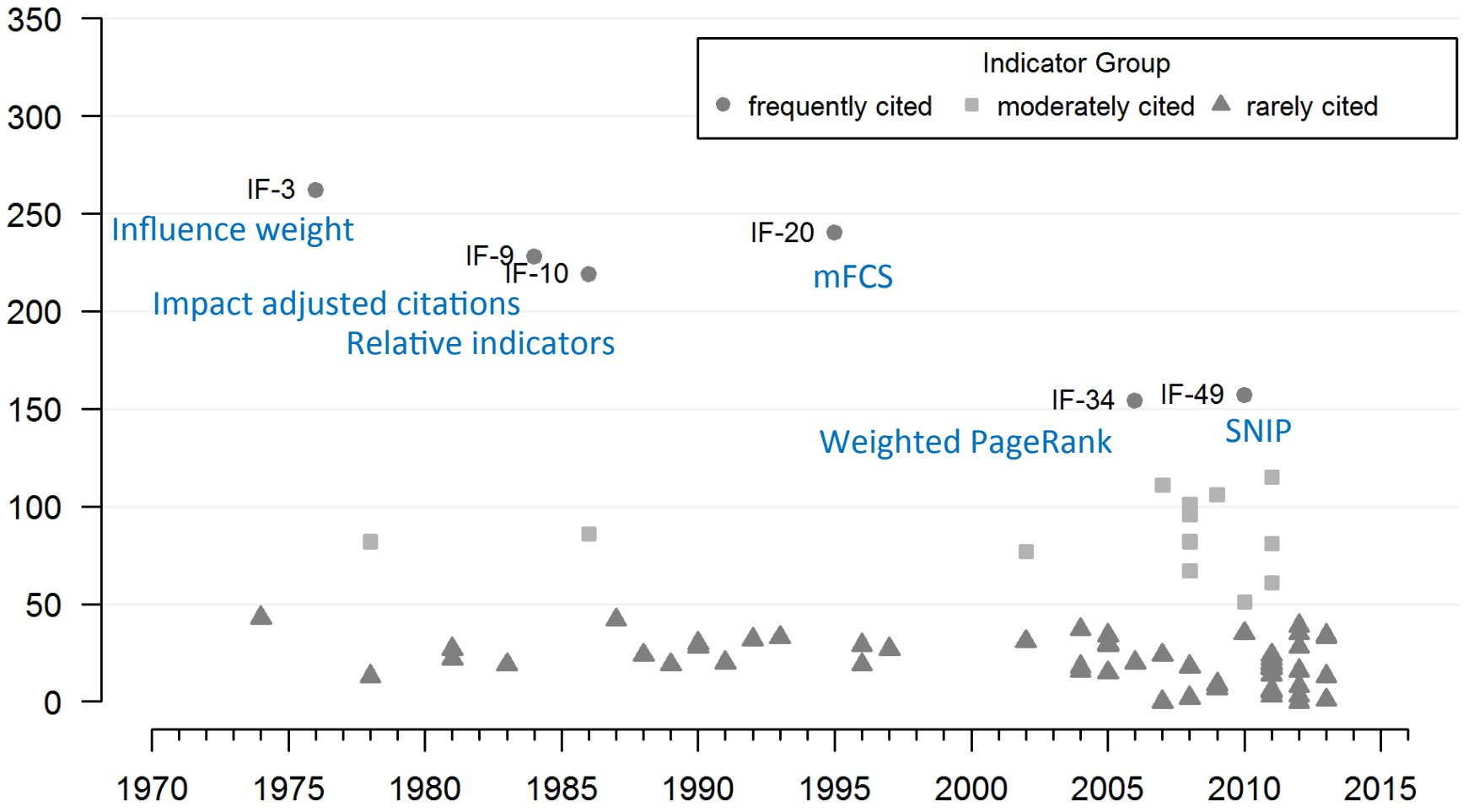


Fig. 2.1: Compilation of indicators based on handbooks and review articles, data source WoS, CSS groups.

2.1 Citation frequencies for 95 HI-related indicators

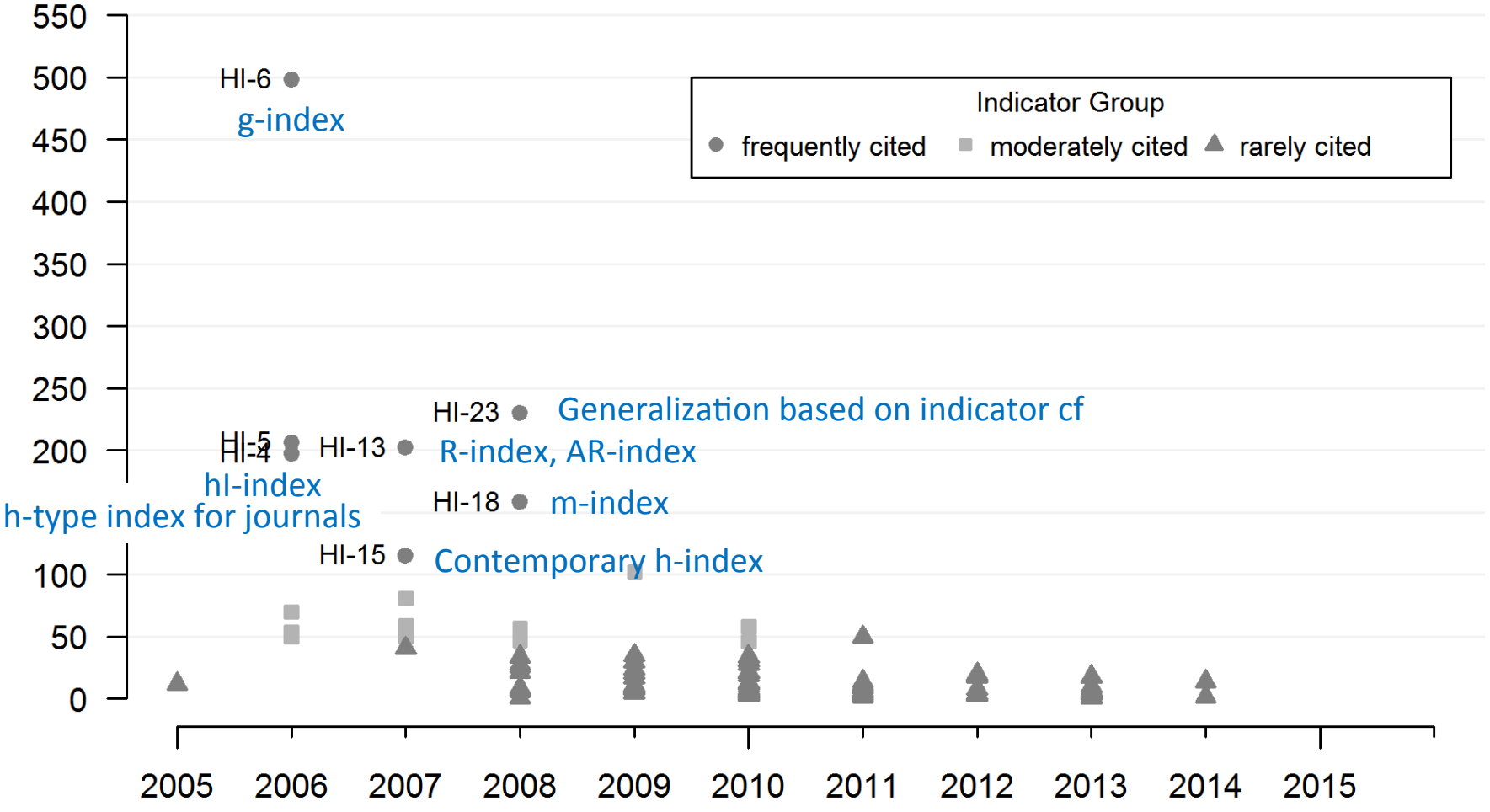


Fig. 1.2: Compilation of indicators based on handbooks and review articles, data source WoS, CSS groups.

2.1 Growth of evaluative citation analysis subfields

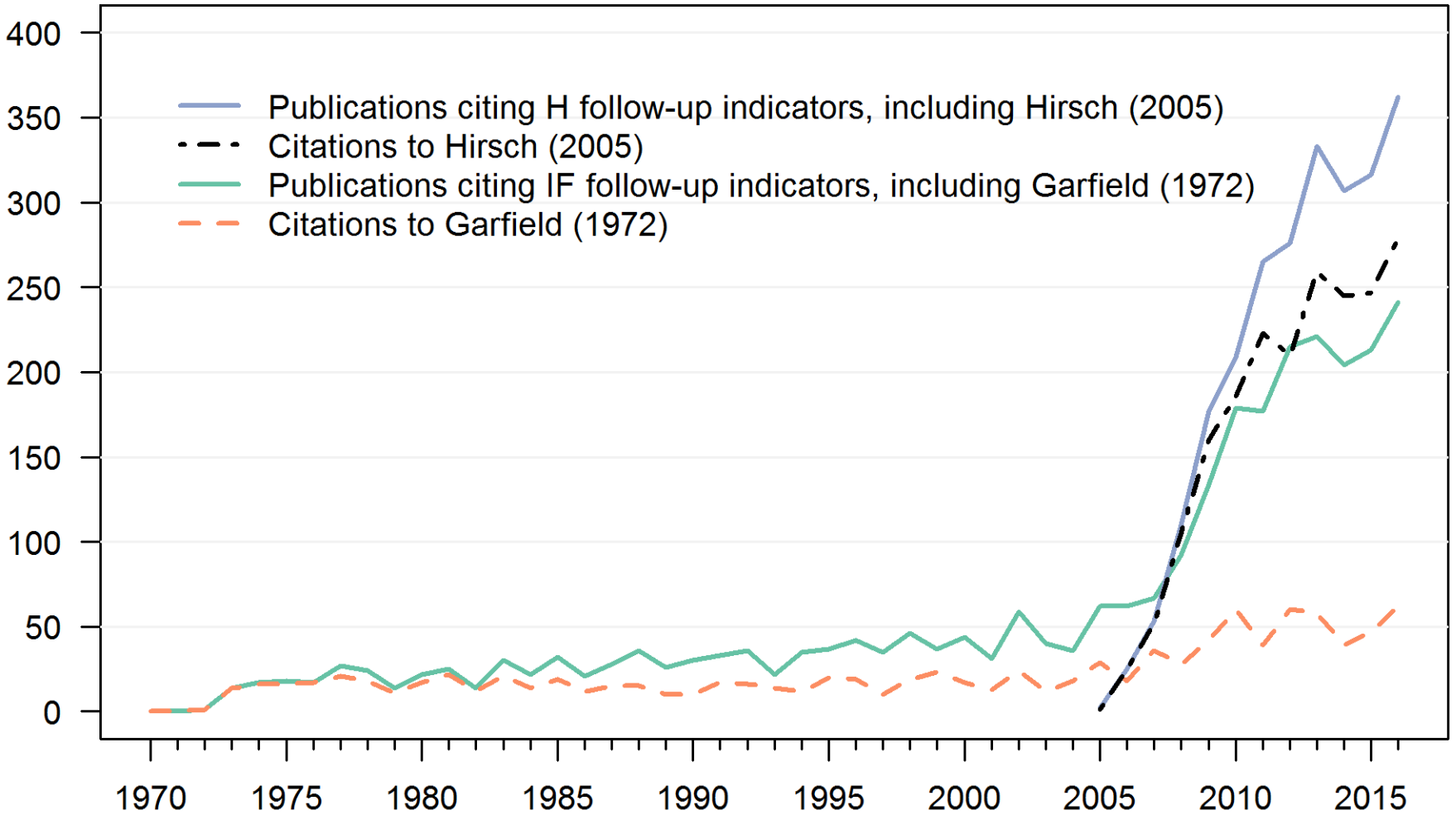
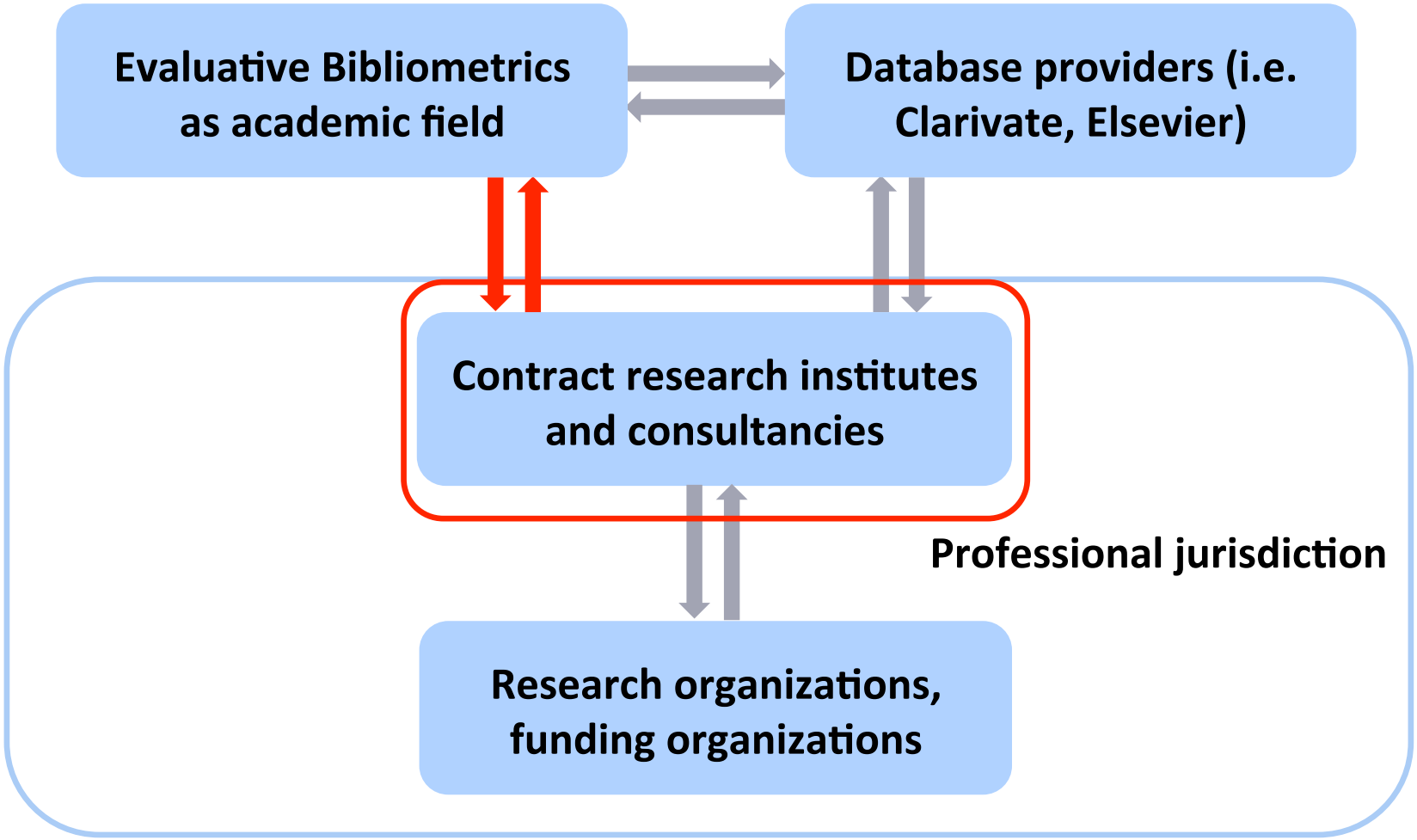


Fig. 2: Data source: WoS, publications 1972-2016.

RQ2: Which indicators are used in evaluation practice?



3.1 Meta-analysis evaluation studies: selection criteria

(1) The study applies advanced bibliometric methods.

(2) The study evaluates important elements of national research systems in Europe, i.e. funding agencies, programs, research organisations, universities, departments, institutes, research fields or groups.

(3) The study was undertaken as information for strategic decision making in science policy or science administration.

(4) The study was completed in the period 2005-2014.

The 35 most central institutions in the field citation network within Europe were asked via email to contribute evaluation study reports. Response rate 54%, studies provided by 34%. Study set includes 50 evaluations from 11 countries in Europe.

3.2 Meta-analysis evaluation studies: preliminary findings

- The evaluation objects are funding instruments (40%) and research organisations (60%) from eleven countries.
- The dominant approach are field normalized citation indices (75%), frequently combined with percentile indices (50%).
- H-index is sometimes used (12%). Indirect citation metrics and source normalized indices are not applied (0%).
- The study set contains 18 different expert organizations or individual professionals applying bibliometric analysis.

3.3 Most frequently applied indicators (IF-related)

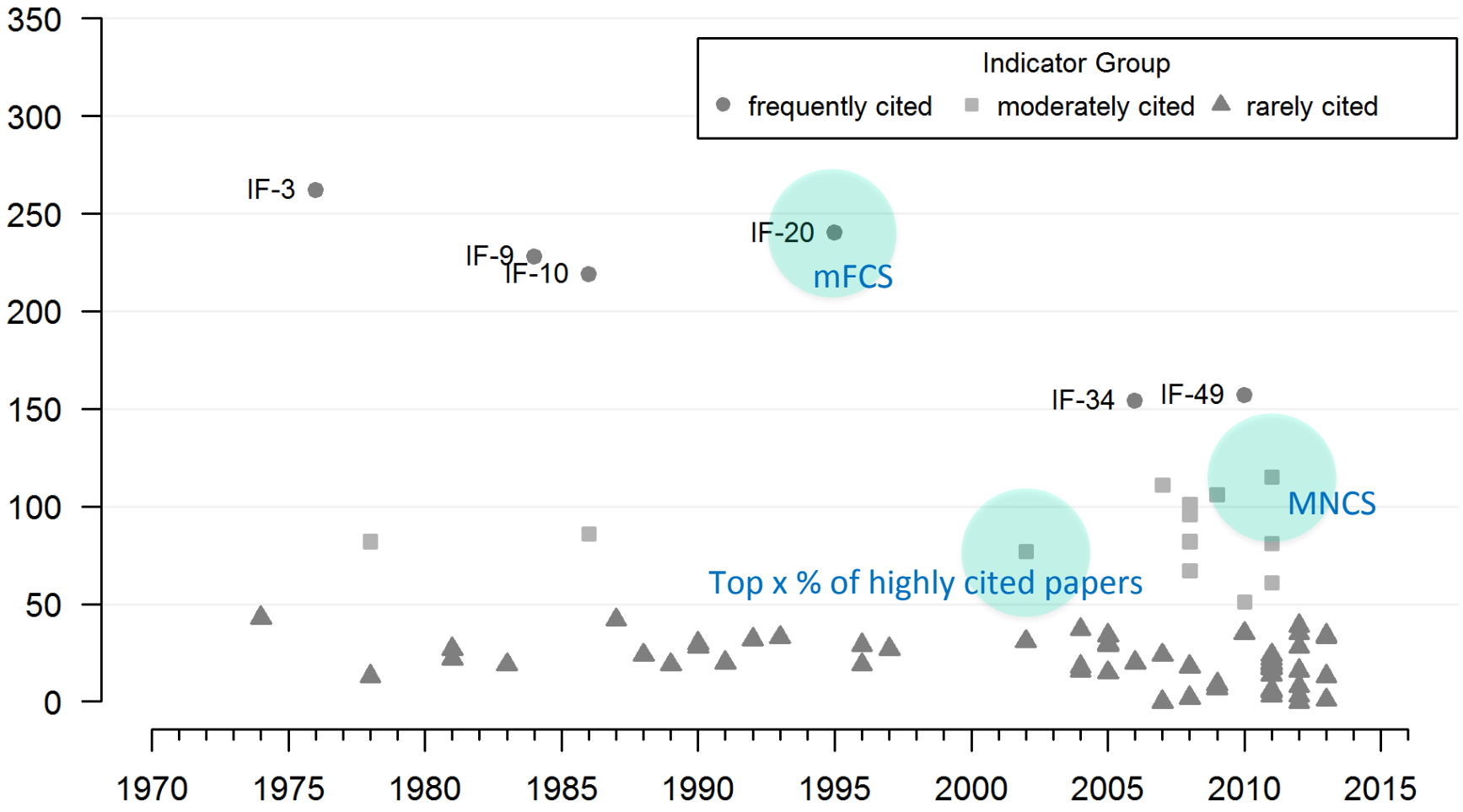


Fig. 3.1: Compilation of indicators based on handbooks and review articles, data source WoS, CSS groups.

3.3 Most frequently applied indicators (HI-related)

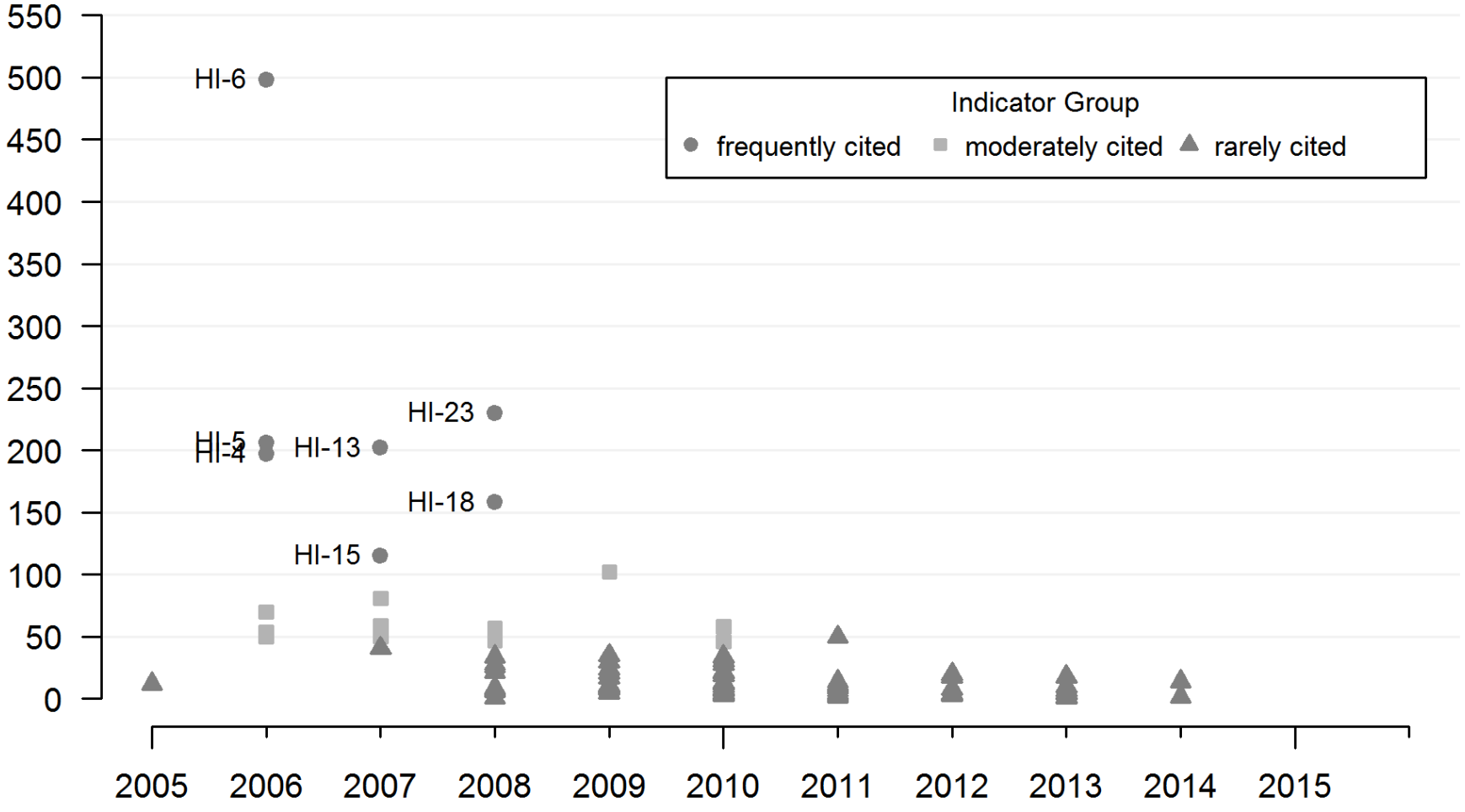


Fig. 3.2: Compilation of indicators based on handbooks and review articles, data source WoS, CSS groups.

3.3 Methods used by expert organizations 2005-2014

Expert organization	Field normalization	WoS Subject Categories	Top percentiles	Indirect citations	Source normalization	HI-type
CWTS Leiden	x	x	x	–	–	–
IFQ/ DZHW Berlin	x	x	x	–	–	–
MPG München/Stuttgart	x	x	x	–	–	x
NIFU Oslo	x	x	–	–	–	–
Swedish Research Council	x	x	x	–	–	–
Wellcome Trust London	x	x	x	–	–	–

Tab. 1: Data source: Own compilation.

Conclusion

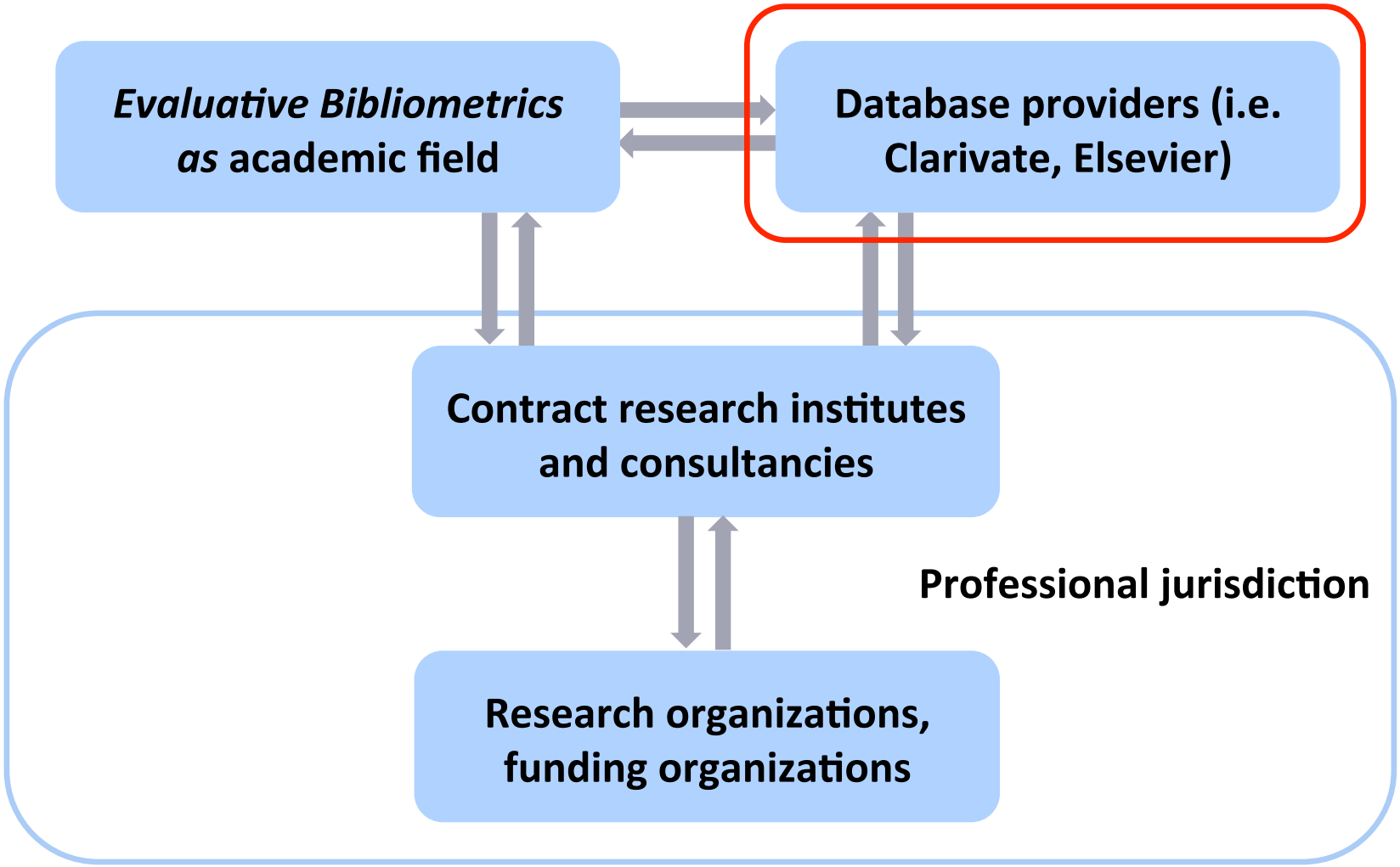
1. The academic sector develops diversified citation impact metrics but has little if any standard setting influence.

2. Leading professional organizations seem to converge on broad de-facto standards for professional research evaluation (cognitive claims to jurisdiction).

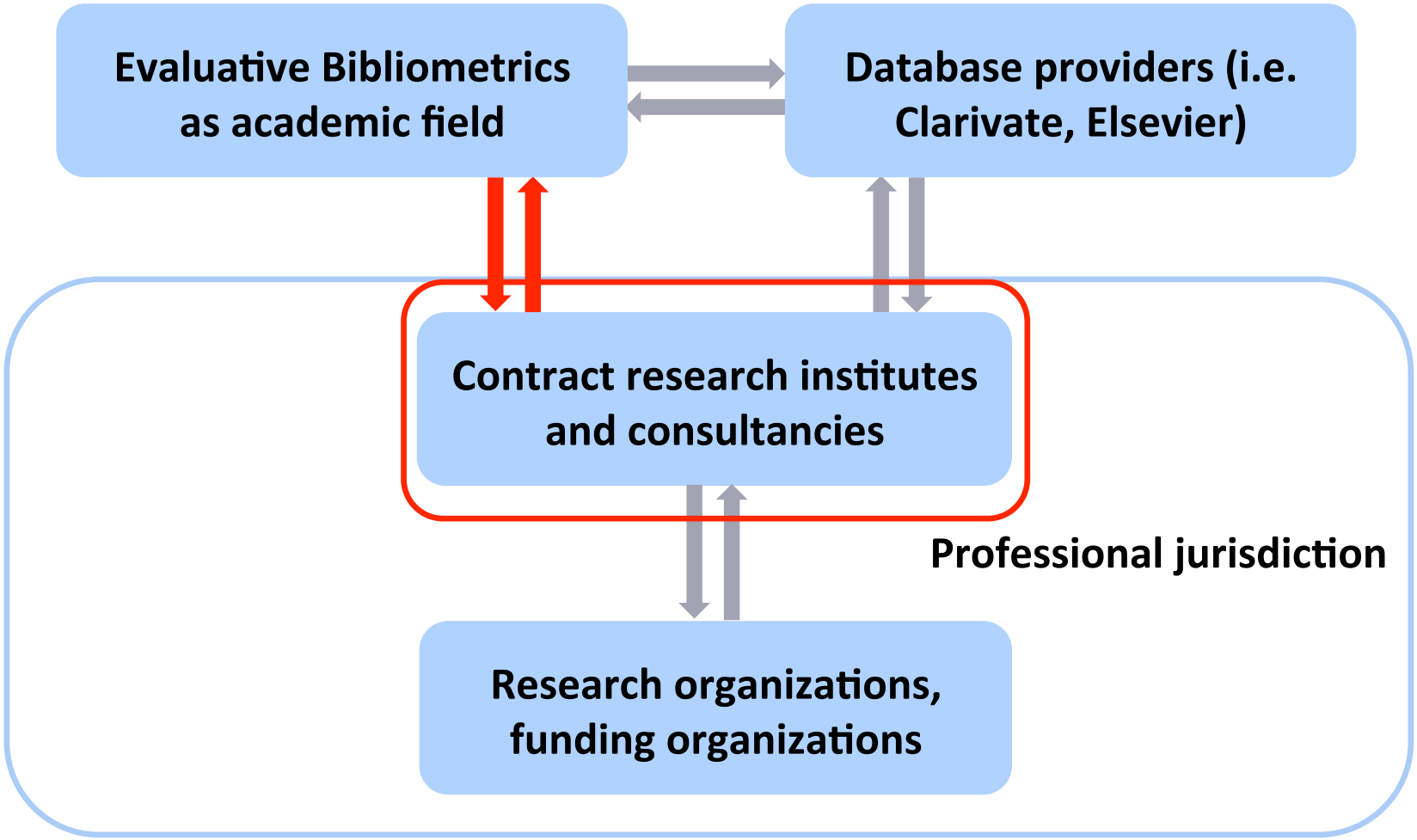
3. The jurisdictional claims by expert organizations are threatened by ready-made indicators that are distributed online by commercial database providers.

4. The analysis of professional developments needs a historical perspective, covering at least several decades.

3.3 Future research and science policy



RQ3: History of CWTS as an influential expert organization?



Project publications

Petersohn, S. (2016): Professional competencies and jurisdictional claims in evaluative bibliometrics: The educational mandate of academic librarians. *Education for Information, 32*(2), 165-193.

Jappe, A.; Heinze, T.; Pithan, D. (under review): Reputational Control and the Professionalization of Evaluative Citation Analysis.

Petersohn, S.; Heinze, T. (under review): Professionalizing Bibliometric Research Assessment? Insights from the Leiden Centre for Science and Technology Studies (CWTS). (1980-2016).

3.2Expert organizations included in this meta-analysis

- Centre for Science and Technology Studies CWTS, Leiden
- Centro de Ciencias Humanas y Sociales CCHS-CSIC, Madrid
- DAMVAD Analytics, Kopenhagen
- Information Retrieval Service, Max Planck Institute, Stuttgart
- Research System & Science Dynamics at the German Centre for Higher Education Research and Science Studies DZHW, Berlin
- Nordic Institute for Studies in Innovation, Research and Education NIFU, Oslo
- Technopolis Group, Brighton
- Wellcome Trust, London