

25 Cooperative data in a comparative perspective

Avoiding pitfalls for robust data aggregation

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1 Introduction

Researchers, think tanks, and (non-)governmental agencies often present cooperatives as relevant structures to support bottom-up collective initiatives toward fairer and more sustainable economic practices (Defourny, 2009; Dufays et al., 2020; International Labour Organization, 2023; Novkovic, 2022; United Nations, 2022). The current redevelopment of cooperatives as an alternative business model comes as no surprise in the current context of power imbalances and uncertainties (Muñoz et al., 2020; Novkovic, 2009).

Comparative and aggregated data analysis over time and space can help grasp the full extent of this movement in redevelopment. They can also help grasp the effective impact of cooperative development on society, beyond their own members' benefits (Artis et al., 2015; Novkovic, 2023; Novkovic et al., 2022). Haverman and Nedzhvetskaya (2022), for example, perform this analysis across two European countries over the 19th and 20th centuries. Cooperatives, as user-value orientated and participatory organizations, may support broader evolutions in income and power distribution, decommodification of work and essential goods, value chain resilience, longevity, and economic justice (Novkovic, 2022). Capturing this variety of impacts implies designing appropriate indicators in light of newly collected or existing data on cooperative development (Artis et al., 2015; Novkovic, 2022).

These comparative and aggregated research endeavors require a mobilization of past and present-day data across sectors and at a national or international comparative level. This chapter focuses on outlining standards of historical critique to perform this cross-sectoral and comparative analysis of cooperative development and impact. This chapter analyzes how to adequately aggregate a variety of relevant sources in accordance with the epistemological rigor of history as an academic discipline. This chapter aims to support a call for adequate coordination and treatment of past historical sources of cooperative data and future historical sources in the making by researchers and practitioners of the cooperative realm.

2 Challenges of data aggregation over time and space

The scientific literature offers several examples of comparative and aggregated data analysis on cooperative development. These studies typically focus on limited time spans and sector-specific developments, approached from regional (Medina-Albaladejo et al., 2021), national (Henriques et al., 2020; McLaughlin et al., 2023), or cross-national comparative perspective (Fernández, 2014). These source-based investigations draw on a combination of primary materials, including regional or national registration and compilation data (Medina-Albaladejo et al., 2021), sector-specific sources (Henriques et al., 2020; McLaughlin et al., 2023), and datasets compiled by international organizations (Fernández, 2014). However, when attempting to trace cooperative development across sectors and over longer timeframes, these sources may prove limited or incomplete. In such cases, researchers have supplemented datasets with a wide array of additional materials, including national and local newspaper screenings, and sources from value chain intermediaries (Patmore et al., 2021, 2023). In that instance, data collection was primarily the result of a multi-year, consortium-based effort conducted within the framework of a funded research project (Balnave & Patmore, 2019). Noticeably, Co-operatives UK has institutionalized a long-term multi-partner national database, continuously updated using a variety of historical sources (Co-operatives UK, 2021)¹.

Outside the geographical scope of consortia projects or institutionalized databases, researchers need to find data sources that are not only valid and credible but also exploitable at a reasonable time cost and accessible. Additionally, they may face challenges of comparative measurement across countries. Legal definitions, standards of data gathering, and processes of data aggregation may indeed vary in time and space (Artis et al., 2015; Fici, 2013; Novkovic, 2022). Ultimately, collective organizations, which may have previously adopted the cooperative status, could, under the influence of the evolving legal framework, select another status compatible with that new framing (Bouchard et al., 2015; Serres et al., 2022; Serres & De Moor, 2023; Van Baelen, 2021). The reverse may also have been true. As the national legal framework evolved throughout history, some organizations, considered in the past as cooperatives, may no longer answer to the cooperative principles and their translation in legal frameworks (Fici, 2013).

The challenges, hence, relate to the issue of source interpretation and value for comparison across time and space. They concern:

- the comparability of sources due to differing measurement and aggregation standards (Artis et al., 2015);
- the evolving legal definitions over time and across regions, which complicate the coherent and exhaustive categorization of organizations as objects of study over time and space (Fici, 2013);
- unequal access to reporting sources over time and space, depending on the capabilities, institutional resource and agency to compile and archive these sources (Kipping et al., 2013; Lipartito, 2013).

This chapter explores these challenges, resorting to an analysis of the historical evidence related to the forelast wave of cooperative development in Western Europe over the 19th and 20th centuries. We set the geographical boundary of our source quest on Western Europe, specifically. We believe, however, that the historical critique we apply to the uncovered sources applies more broadly to sets of sources covering other geographical areas. By drawing from this analysis insights on source preservation of the current wave of cooperative development, the aim of this chapter is to support a call for adequate treatment and anticipation of data collection related to cooperatives' development.

3 A framework of historical critique for analysis

Given the above-mentioned challenges, interpreting cooperative data from a paradigm of a-historicity, conflating them over times and places to reach de-contextualized insights on cooperative development, makes little sense (Clark & Rowlinson, 2004; Spector, 2014). Our intention is hence to consider sources of data on cooperatives from a historical perspective, that is, as witnessable extracts of the studied past times and of their evolutions (Heller, 2023; Lipartito, 2013; Yates, 2013).

The validity of the sources of data refers to the accurate identification of their producer and time of creation. It is of crucial importance to assess where and by whom the data were produced and whether they rely on primary data (in our case, directly communicated by or generated by cooperatives) or result from the compilation of primary data in secondary sources. Beyond validity, the sources must be credible, in the sense that the information they contain "...were not created to make a statement, take a position, or advance a theory ..." (Lipartito, 2013, p. 290 referring to Rowlinson, 2004). When we talk about numerical data, like the ones indicating features of cooperative development, the intentionality of the authors of the sources, or the worldview expressed, may in appearance not matter so much as with narrative primary sources (Lipartito, 2013). Notwithstanding, documents may be created following a particular paradigm in line with the author(s)' world view. Historical critique hence requires assessing the motivations underlying the creation of a source of data (Rowlinson & Hassard, 2013). Data should at best have been compiled according to standards of rigor and designed to provide a faithful picture of reality. Secondary sources, that is, sources mobilizing or commenting on the primarily generated sources of data over time, may be of use in this analysis (Lipartito, 2013).

Finally, historical critique requires raising the overarching question of what the data represent and how to identify their possible shortcomings in terms of exhaustiveness (Kipping et al., 2013). The latter dimension, that of what the data represent, is of fundamental importance for comparative and aggregated analysis. Indeed, assessing the evolution of cooperatives over a long period of time may require triangulating a variety of sources, some of which may evolve over time, and some of which may provide the same information twice. The question of their mutual coherence, and of their coherence over time, is hence one of the fundamental points of discussion in such an endeavor (Kipping et al., 2013).

Data analysis ought to consider the sources under these three different angles of historical critique:

- Criteria of validity:
 - Data producer
 - Time of data creation
- Criteria of credibility:
 - Intentionality and scope of the data production
 - Expected rigor of the data collection
- Criteria of representativity
 - Nature of the source: primary or secondary
 - Degree of exhaustiveness of the data

4 Application of the epistemological framework to a selected set of cooperative data

Drawing on the papers and databases described in the introduction and on several secondary sources (Cole, 1944; Gide, 1971; International Labor Office, 1934), we identified three main sources covering cooperative development in Western Europe over the 19th and 20th centuries:

- The mandatory registration data and related statistics, compiled at national level;
- The data and statistics of national cooperative unions and federations;
- The statistics and compilations of international cooperative federations.

The following subsections analyze these three types of sources based on our epistemological framework as an illustrative case of the added value of historical critique in navigating the challenges of data comparison and aggregation over time and space.

4.1 Registration data at national level

Cooperatives appear usually as an “entry in a commercial register” or in “a special register for co-operative societies” (International Labor Office, 1934, p. 867). Researchers may access registration data and files, either in the form of written or printed archives or in the more recent form of digital open datasets. These data are contingent upon the existence of a legal framework recognizing cooperatives as distinct organizations and upon the definition of cooperatives, which may vary over time and places (Fici, 2013; International Labor Office, 1934). Within that frame, researchers may expect valid and credible datasets, that is, unless there are doubts about the ability of the national services to perform their registration and compilation duties adequately.

The availability of the primary registration datasets in their archival form depends upon the proper archival of the registers. Other primary sources, complementary to the former, exist, e.g., the mandatory depot of foundational acts, statutes, statute modifications, and board nominations in the official state gazette (see, e.g., for Europe, European Forum of Official Gazettes, 2009). The treatment of all these sources nevertheless requires a work-intensive translation effort from historical copies to exploitable datasets. The triangulation of registration data with mandatory depots in official gazettes requires a careful case-by-case analysis. For instance, cooperatives may remain in existence as empty shells, specifically in situations of coordination leading to mergers, for several decennia. They may also fail to register an effective dissolution (International Labor Office, 1934). Other complementary sources, like newspapers, may help bring micro-level clarity to the extent of a phenomenon likely to artificially increase the macro-level numbers.

The recent digitization of registration datasets in open data repositories facilitates data compilation. The absence of a proper policy of digital archiving may require researchers to download the datasets on a regular basis over time to avoid data losses (see e.g., Dufays & Mertens, 2017; Staessens et al., 2021).

The content of the registration databases varies. The databases usually include the name, date of foundation, main address, object, membership, number of subscribed shares, and dissolution date of cooperatives (International Labor Office, 1934). One may thus expect reliable information on sectoral distribution and membership from these datasets. Recent studies, however, urge caution when interpreting membership data recorded at the time of registration. These figures reflect only the initial situation and, when aggregated, may obscure multiple-counting due to individuals holding simultaneous memberships in different cooperatives (Staessens et al., 2021).

4.2 *National statistics based on registration datasets*

Central statistic offices provide aggregated statistical compilations. These secondary statistical datasets are likely, in most countries, to rely on the primary registration data. Beyond statistics based on registration, other administrations in charge of a particular sector may also publish statistics of relevance for cooperatives (Fauquet, 1939; International Labor Office, 1934). These secondary sources may provide researchers with a straightforward source of numerical data on cooperative development.

Statistics build upon the provisions of identification foreseen in the primary registration acts. They could be deemed exhaustive within this frame. As for registration data, researchers may expect valid datasets, with a straightforward identification of producer and date of production.

Secondary sources offer words of caution as to how the contingency linked to the legal definition of cooperatives affects the credibility of the statistical datasets. For instance, rigorous statistics on cooperatives would ideally cover every institution “which conforms with certain legal requirements” (International Labor Office, 1934, p. 868), integrate cooperatives registered under different acts, and exclude

the institutions that the acts allow to identify as non-cooperatives (International Labor Office, 1934, p. 869). Assessments of the credibility of national statistics in adequately reflecting these provisions vary across secondary sources. Some affirm that the data “conform on the whole with the standards universally accepted by co-operators” (International Labor Office, 1934, p. 869), while others caution that the statistics “are very uneven in value, even if comparison is limited to countries where the co-operative movement is already highly developed and of long standing” (Fauquet, 1939, p. 454).

It’s therefore probably safe to advise researchers to investigate the methodology of statistical compilation and/or to try to find secondary sources in the archival sets of statistical offices providing explanation as to:

- whether the statistics cover all or only parts of the acts registering cooperatives.
- whether the statistics duly exclude non-cooperatives possibly registered under the same acts.

Beyond the accurate translation of registration provisions, the credibility of cooperative statistics is also shaped by the methodology used in their compilation. In many instances, figures are derived by comparing the number of cooperatives registered in previous years with those newly registered or dissolved in the reporting year. However, this approach

does not take into account the societies which have begun to function but which have not yet been registered, those which have ceased to function but have not formally gone into liquidation, and those which are dissolved but have not registered the fact (a common case).

(International Labor Office, 1934, pp. 873–874)

The issues of credibility and the contingency of legal definitions inevitably impact transnational comparison. Not only are these comparisons contingent upon varying legal definitions and upon the rigorous compilation of cooperative data across differing acts. The methodology of statistical compilation is also likely to vary, in particular in the way the offices classify the cooperatives in sub-groups (Fauquet, 1939; International Labor Office, 1934). Statistics generally follow two orders of classification: territorial (e.g. urban, rural cooperative) and/or functional (e.g. credit, supply, purchase, processing cooperatives). There are also cooperatives overlapping this classification (Fauquet, 1939; International Labor Office, 1934). The different types of cooperatives did not develop in a similar way in every country. The statistics are likely to reflect each country’s specificities in the “different numbers of groups and subgroups and their different degrees of precision” (Fauquet, 1939; International Labor Office, 1934, p. 869). Some statistics may roughly “classify widely different types of societies under one head” (International Labor Office, 1934, p. 869), and others may be differently detailed. These classifications may also vary over time as classification methods evolve at national level. Retrospectively, no subdivision of comprehensive classifications is possible, meaning

that the data can only be compared when aggregated to the widest subclassification adopted (International Labor Office, 1934).

In terms of content, the statistical datasets present aggregated data on cooperatives. The richness of the statistical datasets may vary considerably from country to country and over time. Older records sometimes mention the number of cooperatives solely. Membership figures and business volumes may be missing from some records (International Labor Office, 1934). The caution advised for the aggregation of membership data expressed in the previous point (Staessens et al., 2021) understandably also applies to the interpretation of aggregated membership numbers in the official statistics (Fauquet, 1939).

4.3 *Registration data of national or regional cooperative unions and federations*

Cooperative unions and federations are representative and federative bodies commonly found in cooperative development. To identify these organizations and understand their sectoral and societal scope, researchers can rely on various sources. These include secondary literature (Cole, 1944; Gide, 1971), primary sources from national federations such as the yearbooks available at the Bibliothèque Nationale de France (2023) which contain rich information on the federative landscape in other countries, repertoires of international federations (International Cooperative Alliance, 1910, 1926; Plunkett foundation for co-operative studies, 1927), and scientific literature (Morales Gutiérrez et al., 2005; Patmore & Balnave, 2018; e.g., Scholliers & Grauwels, 1982). A solid understanding of the socio-political context is particularly important, especially in countries where cooperative organizations evolve within socio-religious segmented spaces, as seen in Ireland, Belgium, and the Netherlands (Colvin & McLaughlin, 2014; Henriksen et al., 2015; Scholliers & Grauwels, 1982). Secondary sources can further help trace the historical evolution of federations and how they changed names, expanded or narrowed their scope, merged, split, or experienced internal dissent. Such contextual knowledge is essential for interpreting data from a historical critique perspective.

Depending on the federation, the registration information available may cover a scope that differs from the official registration data covered in the previous points. The federations may indeed represent a subcategory of all cooperatives or endorse a definition of cooperation that does not align entirely with the legal framework defining cooperatives (Fauquet, 1939; International Labor Office, 1934). The way they define cooperatives, potentially excluding some and including non-cooperatives assimilated as cooperatives, makes these data an interesting complement to official registration data. Within this frame, and considering the specific scope of the federations, the registration data, if available in the archives, may constitute valid and credible complementary information to official registration data.

Like official registration data, registration lists or files are micro-level data that need to be aggregated. Hence, the work-intensive translation effort from historical copies to exploitable datasets also applies in this case, with the multiplying effect that researchers may identify various federations depending on the way the cooperatives

group themselves. Another issue may be the adequate conservation of the related archives by the federations. If the federation is no longer active or wasn't part of a larger socio-political movement, and no one ensured proper archival conservation, researchers may not find relevant data to exploit (Rowlinson & Hassard, 2013).

Rather than accessing actual registration data, researchers may instead encounter annual lists of members, which are often accompanied by member-specific details such as creation dates, sales figures, and share volumes. Alternatively, yearbooks may present aggregated data on the business volume of cooperative enterprises (Bibliothèque Nationale de France, 2023; Gide, 1971). While yearbooks are rich in textual information, extracting usable data from member lists, much like with official registration records, requires a labor-intensive process of translating historical documents into exploitable datasets. If yearbooks are not available or only available for a limited time period, researchers may look alternatively in the archive inventories and library catalogs for annual reports, surveys, or monthly newsletters likely to contain relevant information. This is a time-intensive effort of retracing and identifying available historical sources.

The cross-national comparison of the data obtained may be rendered complicated by the varying and specific scope adopted by each federation within its own national context. This dimension appears even more clearly in the next point dealing with the macro-level statistics of these federations.

4.4 *Statistics from national or regional cooperative unions and federations*

Statistics provided by national cooperative unions and federations typically offer aggregated data. When a federation does not include a dedicated statistical section in its yearbook, such data may still be published periodically throughout the federation's existence.

What we detailed in the previous point, regarding the specific scope of federations, applies also to their statistics. This difference in scope with official statistics is what makes their relevance for comparative and aggregated analysis from a historical critique perspective. Federations may base their statistics on national registration data or statistics, but often go further by producing "a new compilation in which the co-operative federations use their own judgement and their own information as well" (International Labor Office, 1934, p. 867). Within the consideration of their specific scope, and provided the researchers can find assurances as to the rigor and methodology of the federations (see the next heading in this regard), these statistics hence offer an interesting complementarity with the official national statistics.

The main issue, in terms of cross-national comparison, lies in the comparability of the figures gathered by organizations and federations. There is, first, the already mentioned difference in scope of each federation. More importantly, this difference in scope may influence the classifications of the statistics (Fauquet, 1939). The choices of classification may vary from more comprehensive to more homogeneous subgroups. As for national statistics, the data can only be compared when aggregated to the widest subclassification adopted (International Labor Office, 1934).

In terms of content, the federation statistics may contain more detailed sets of data than official statistics (International Labor Office, 1934, p. 873). The caution advised regarding the aggregation of membership data (Staessens et al., 2021) understandably also extends to the interpretation of aggregated membership figures reported in federation statistics.

4.5 *Compilations of international co-operative federations and organizations*

This section covers a range of organizations that published, on a regular or on an occasional basis, relevant material for comparative or aggregated analysis. International organizations and federations range from:

- The international federations of cooperative organizations: e.g. the International Cooperative Alliance and the International League of Agricultural Co-operative Societies;
- The multilateral organizations: e.g. International Labor Office - ILO, the League of Nations, and the Organisation for Economic Co-operation and Development - OECD;
- The private organizations: e.g. the Horace Plunkett Foundation.

To understand the context in which the international co-operative federations developed and their scope, secondary sources (Cole, 1944, pp. 352–363; International Labor Office, 1959, pp. 541 and following) or recent monographs (Patmore & Balnave, 2018) are of help. For instance, the scope of the International Cooperative Alliance (ICA) changed following dissent by several agricultural cooperative federations between 1904 and 1912, leading to the creation of the International League of Agricultural Cooperative Societies. The International Cooperative Alliance henceforth mainly represented consumer cooperative federations (Patmore & Balnave, 2018).

The ICA was prolific in publications on cooperative development. In addition to periodicals, the organization regularly published yearbooks and statistical reports throughout the 20th century, which are valuable resources for comparative and aggregated analysis (International Cooperative Alliance, 1898, 1910)². Contrary to any assumption, we found aggregated data both in the yearbooks and in the statistics, and data on individual cooperatives in the statistics. The sources provide the data country by country, with a categorization that may vary, depending on the nature of the cooperative development in each country.

In terms of scope, the data reflect the focus of the ICA and of its federation members. What we explained in the two previous subsections in terms of validity and credibility applies for these data as well. Interestingly, the sources provide information on the way the national federation produced the aggregated statistics by mentioning that they resorted to surveys of their members (International Cooperative Alliance, 1898) and the number of respondents. Researchers can thus ideally consider the credibility and representativity of the national/federation statistical data (see previous heading) under this angle.

The richness in information is important in the aggregated and in the individual cooperatives' data. The content of these documents spans a range of data, from membership figures to business volume, with features tailored to each cooperative type (e.g. inventory value for housing, consumer, and producer cooperatives; number of loans granted for credit cooperatives; and volume of milk collected for dairy cooperatives). The documents also enable a clear differentiation between cooperative types, including distinctions based on rural-urban settings and on the specific functions of the cooperatives. Like registration data, the compilation of this richness of data into exploitable datasets is time intensive. The availability of these sources over a long time span (see footnote n° 2) makes them an adequately centralized source of information over a variety of countries – within the specific scope of the involved federations.

Statistics produced by multilateral organizations, such as the International Labour Organisation, represent the highest level of data aggregation. The figures are typically presented in broad comparative tables where each row corresponds to a single country and is further aggregated into continental or global totals (International Labor Office, 1934, 1939). Although these sources are not available for a long time span, they can adequately serve as mile markers to put in perspective with the other sources. Their validity and credibility lie in the corpus of historical critique explanation accompanying them (Fauquet, 1939; International Labor Office, 1934, 1939). The services in charge of these statistics discuss the issues related to the compilation of data from national sources and the limits to their compilation enterprise. They rely on a diversity of sources: national statistics, federation statistics, and “estimates by well-informed writers” (International Labor Office, 1934, p. 867). They can thus be assumed to be as exhaustive as possible. They faced the limits of cross-national comparisons already described in the previous points. They oriented their choices of aggregation accordingly, that is, by aligning as much as possible with the sub-groups proposed by national federations/central statistical office and regrouping numbers into homogeneous categories when the sub-groups didn't match in content or level of detail from one country/federation to another (Fauquet, 1939; International Labor Office, 1934).

Practical, valid, and reliable for research, these data are, sadly enough, only available for specific and limited years. Indeed, their availability depends upon the multilateral organizations taking the initiative of doing the aggregation exercise. In the search for relevant aggregated data, sectoral statistics from multilateral organizations, such as the agricultural export data compiled by the League of Nations and the International Labor Office (1926) or yearbooks from private organizations like the Plunkett Foundation for Co-operative Studies (1927), serve as valuable complements to the aforementioned sources.

The yearbooks of the Plunkett Foundation³ provide statistics on agricultural cooperatives and include reports on national developments in agricultural cooperation (Ajates Gonzalez, 2018). In terms of geographical coverage, editions published before 1930 appear to focus primarily on the British Empire, while those from the 1930s onward also include European countries (Forrester, 1930). However, statistical content is not consistently present in every annual edition (Forrester, 1930).

The yearbooks are organized into country-specific chapters, authored either by local correspondents or by British journalists (Ajates Gonzalez, 2018). The credibility of these descriptions must be assessed in light with the authors' intentions. For example, Ajates (2018) highlights instances where narratives are shaped to emphasize the role of certain socio-religious organizations in the development of cooperatives. Consequently, researchers should subject such accounts and datasets to rigorous historical critique. This includes consulting additional secondary sources in national archives to better understand the authors' motivations, evaluate the methodological rigor of data collection, and assess the comprehensiveness of national coverage. Due to their sectoral orientation, these sources tend to present more homogeneous datasets, which enhances cross-country comparability. However, researchers may still encounter significant variations in how cooperatives develop across different times and regions, making cross-national comparisons complex (Ajates Gonzalez, 2018; International Labor Office, 1934). It is therefore crucial for researchers to contextualize the data appropriately to capture the specific dynamics of cooperative development.

5 Key takeaway for further data analysis on cooperative development

The results, beyond the angles of historical critique (validity, credibility, and representativity), cross practical dimensions:

- the investigative effort, in terms of time and compilation, and its link with the aggregation level of the data.
- the availability of the sources in time, space, or scope.

Mobilizing data on cooperative development, in this regard, is not only a question of obtaining the “best” data, in the sense that the data represent the reality accurately. Reaching this horizon of comparative and aggregated analysis over time and space is about navigating the sources and triangulating them in full awareness of their value and limits. The latter includes the investigative effort that their identification and analysis entail, illustrated as a stepwise approach to the available sources in Figure 25.1.

Data on cooperative development are not just “data”: they result from the production of information by a given institution for a given purpose, within a certain scope. Our analysis showed that the data reflect the scope of these institutions: who they represent in the case of federation, which geographical area they cover, what legal framework defines cooperatives in that area at the time of data collection, and which worldview may lead the institution to extend the definition of cooperatives beyond this legal framework. When data are aggregated, the methodology and rigor of aggregation may vary in time and space. Our results illustrate by the book the cautionary principles of historical critique presented in the section “A framework of historical critique for analysis” on page 495. Data on cooperative development cannot just be conflated over time and space. Before doing so, researchers



Figure 25.1 Illustration, based on authors' analysis, of a stepwise approach of sources into the investigation process.

must rely on a complementary analysis of secondary sources shedding light on the different dimensions of validity, credibility, and representativity as described above. From there, researchers may design appropriate methods to overcome the comparative hurdle across time and space, e.g., by resorting to relative data (see e.g., Fernández, 2014). The application of the principles of historical critique, as illustrated in Table 25.1, helps identify these limits and how to deal with the challenges of differing standards, shifts in legal definition, and limited availability/redundancy of sources on the robustness of the scientific endeavor.

To deepen this critical appreciation, researchers might reflect on how the entire life cycle of the sources they engage with, from initial creation, (partial) preservation or transformation into archival record, to the subsequent use by the researchers themselves or others, shapes the meanings these sources acquire as research material. Each stage in this trajectory influences not only how these sources are analyzed in the present but also how they may inform future scholarly inquiries (see De Herde & De Moor, 2025 for a comprehensive understanding).

In organizing research endeavors, it is unsurprising that extensive databases on cooperative development are often the product of collaborative consortia (see “Challenges of data aggregation over time and space” section). Beyond the time-consuming task of assessing source credibility, researchers frequently face limitations in the temporal scope and completeness of available data, necessitating the combination of multiple sources. The further back in time one investigates, particularly before systematic data collection by federations or formal registration, the more challenging the search becomes. In such cases, specialized teams with deep knowledge of their respective archival landscapes are essential. Achieving data saturation across long time spans through a mix of primary and secondary sources is not a task for individual researchers or even isolated teams. Ideally, it should evolve into a coordinated effort among research teams across countries. While our

Table 25.1 Illustration of how the application of the principles of historical critique informs the challenges of differing standards, shifts in legal definition, and unequal availability/redundancy of sources

<i>Tenet of Historical Critique</i>	<i>Focus</i>	<i>Differing Standards of Data Collection</i>	<i>Shifts in Legal Definition</i>	<i>Unequal Availability/Redundancy of Sources</i>
Validity	Producer Time of production	Mobilize secondary sources to acquire knowledge about the producer and their methodologies at the time of production of the data.	Shifts are expected over space and time – background knowledge needed.	
Credibility	Intentionality and scope of data production Expected rigor	Mobilize secondary sources to assess intentionality, scope, and rigor at the time of production of the data.		
Representativity	Primary or secondary source Exhaustiveness			Apply source triangulation, considering source availability and scope – caution in the interpretation of possibly redundant datasets.

study focused on European data, we contend that the challenges outlined here are globally relevant. Geographic segmentation of such research may naturally align with socio-political boundaries and their corresponding systems of organizational registration. The challenges identified in this study also lead to important recommendations for proactively ensuring the conservation of data on future cooperative development. As legal definitions and organizational forms evolve, particularly with the growing inclusion of social enterprises, some of which might previously have adopted the cooperative model, it becomes essential to closely monitor and adapt data collection practices. Our findings on the limitations of historical sources

reinforce the longstanding call, voiced by Fauquet (1939) and later by Artis et al. (2015), for coordinated standards and methodologies in data collection and aggregation. The quality of tomorrow's cooperative research depends on the careful preservation of today's data. This is a call to action for all stakeholders – public administrations, cooperative federations, and the research community – to support future research by placing the scientific dialogue around source production, preservation, and analysis at the heart of comparative inquiry.

6 Conclusion

Data on cooperative development are necessary if we want to assess the importance of their development and their impact over time and space. To do so, the question of data collection and robust analysis is central. Following the epistemological principles of historical critique, we derived from a European source analysis of cooperative development over the 19th and 20th centuries a series of heuristic challenges. Navigating through the galaxy of longitudinal data revealed a series of pitfalls researchers need to acknowledge before they aggregate data. They need, first, to undergo a thorough screening on their credibility, if needed, by mobilizing complementary sources. This screening can help assess under which scope these data can be considered exhaustive. Second, researchers need to triangulate several sources of data to fill the gaps left by the contingency of data collection and preservation across time and space. Practically, these findings call for the consideration of data collection and analysis on cooperative development as a collective endeavor, where research teams coordinate their micro-level investigative efforts towards the identification of macro-level datasets and patterns. These findings also support a proper consideration of aligning methods of data collection and aggregation on prospective development of cooperatives and other institutions of collective action. This chapter is a call for applying a dimension of collective action into research policy and source mobilization on cooperative development.

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Notes

- 1 The open data guide describes the origin of the collected data: annual returns and accounts submitted to the Financial Conduct Authority, information submitted to regulation authorities, supervising departments or federations, a variety of historical sources (mentioned as such without further details). For some co-operatives for which the data are not publicly available, the dataset provides aggregated information

- 2 Starting 1910, the yearbooks are available in the ICA archives (Brussels) for the years 1913, 1926, 1929, and 1936. Starting 1898, the statistics are available in the ICA archives (Brussels) for the years 1929, 1933, 1949, 1958, 1960, 1962, 1964, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1974, 1975, 1977, 1978, 1979, 1981, and 1982. The documents may have changed title over the years (e.g. the statistics), and the copies of the documents in the archives may alternatively be in French, German, or English (for the yearbooks) or published right away in the three languages (for the statistics).
- 3 A random web search based on the title of the yearbook identifies regular editions ranging from 1925 to the 1970s.

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