EVALUATING INDONESIAN ISLAMIC BANKING SCHOLARLY PUBLICATIONS: A DATA ANALYTICS

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ABSTRACT

This study employs bibliometric analysis to evaluate 443 scholarly works on the topics of Indonesian Islamic banking published on 194 academic platforms, and authored by 1049 scholars. The machine learning tools i.e., R Studio and VOSviewer were employed to analyse the Scopus’ bibliographical data automatically harvested from the database. We developed four research questions based on the theories that are fundamental to bibliometric study, i.e., performance analysis, citation and co-citation analyses, bibliographic coupling and social network analysis, to identify the most impactful manuscripts, scholarly journals, authors, and institutions of affiliation. We further established the discussion of the current issues in Indonesian Islamic banking topics from the keyword analysis and the bibliographic coupling. These findings derive some recommendations for future research. This study provides a supply of scholarly novelty in the assessment of Indonesian Islamic banking publications which are both practically and theoretically importance to regulators, academia and industry professionals.

Keywords: Bibliometrics, Data analytics, Islamic bank, Indonesia.
JEL classification: G18; G21; G28.

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I. INTRODUCTION
The Islamic banking system in Indonesia was shaped in 1983 with the deregulation of the country’s central bank, the Bank of Indonesia (BI), and the BI strategy of banking liberalization in 1988 (Hudaefi & Badeges, 2021). These events opened up critical opportunities for local banks to offer banking products and services which are compliant to Shariah (Islamic law). This event was followed in 1992 by the formation of the country’s first fully-fledged Islamic Bank (IB), PT Bank Muamalat Indonesia Tbk (BMI) (Hudaefi & Badeges, 2021). The state IBs, i.e., PT Bank Syariah Mandiri Tbk, PT BNI Syariah Tbk and PT BRI Syariah Tbk, further merged to PT Bank Syariah Indonesia Tbk (BSI) in 2021. This merger is projected to accelerate the growth of the IB sector in the country and realize Indonesia’s aspirations to become the global hub for Islamic economy, as blueprinted by the country’s National Committee on Islamic Economy and Finance (KNEKS).

Against the history of IBs industry in Indonesia, a critical question is important for scholarly investigation, e.g., to what extent has Indonesian IBs theme been researched in academic studies? The influential publications of IBs literature have not discussed this critical question. Those studies have primarily dealt with the fundamental issues of both financial and religious features of IBs. For example, the religiosity of IBs has been regarded to the IBs being interest-based or vice versa (Chong & Liu, 2009), including some critical questions about IB’s Islamicity (Khan, 2010). Meanwhile, the publications on finance-related topics have mainly compared IBs and its counterpart; conventional banks (CBs) regarding their efficiency and stability (Beck et al., 2013), the IB’s financial stability (Čihák & Hesse, 2010), the IB’s risk (Abedifar et al., 2013) and others. Thus, a significant space is wide open for research into the current state of Indonesian Islamic banking literature. This study aims at this goal.

In this work, a bibliometric analysis, i.e., a kind of data analytics for evaluating scholarly publications, is performed to understand the current state of publications on Indonesian IBs theme. The bibliometric data from the Scopus database is considered important to provide relevant data to answer the research questions. Machine learning, i.e., RStudio and VOSviewer, are used by the authors for the investigation. A further interpretation of human intelligence is made to discuss relevant issues for future researches. This study is of vital importance to the academic community, IBs industry professionals and local regulators. This work best serves as the primary reference to obtain reliable and comprehensive information on Indonesian IBs research.

II. LITERATURE REVIEW
A scholarly assessment of the current development of research on Indonesian IBs is considered crucial to understand the recent context from the broader perspective of scholars worldwide. More broadly, recent influential IB publications have mainly addressed the fundamental issues of IBs, their performance and customer-related issues.

Critical works that discuss the fundamentals of IBs include questions on the risk of IBs (e.g., see; Abedifar et al., 2013), queries on Shariah (Islamic law) issues of IBs (e.g., see; Caraka et al., 2021; Chong & Liu, 2009; Khan, 2010; Mollah &
Zaman, 2015), and others. Furthermore, research on IB performance has primarily compared the performance of financial soundness between IBs and CBs (e.g., see: Beck et al., 2013; Bourkhis & Nabi, 2013; Čihák & Hesse, 2010; Johnes et al., 2014; Srairi, 2010). Some work has also addressed ethical and social issues (see for instance; Farook et al., 2011; Haniiffa & Hudaib, 2007; Maali et al., 2006), and IBs based *maqasid al-alshariah* performance (see; Alhammadi et al., 2020; Hudaefi & Badeges, 2021; Hudaefi & Noordin, 2019; Tarique et al., 2020). Additionally, research on IBs’ customer-related topics has addressed customer behavior, customer satisfaction and customer preferences (see for example, H. Amin et al., 2011; M Amin & Isa, 2008; Muslim Amin et al., 2013; Erol & El-Bdour, 1989; Metawa & Almossawi, 1998; Naser et al., 1999).

Against the broader themes of IBs research as mentioned above, a gap in knowledge specifically lies in the topics of Indonesian IBs, particularly an evaluation of its current development. This limitation underscores the importance of this study. A bibliometric analysis is useful to understand the development of issues related to Indonesian IBs research. The following section is therefore devoted to explaining the theoretical underpinnings that ground the bibliometric analysis that this study adopts.

2.1. Theoretical Framework

There are three main streams for evaluating scientific publications (i.e., systematic literature review, meta-analysis and bibliometric analysis). A bibliometric study adopts a quantitative approach and qualitative interpretation to evaluate large amounts of data to identify the emerging trends of a research topic and its intellectual structure (Donthu, Kumar, Mukherjee, et al., 2021). The meta-analysis has two aims, summarizing the empirical evidence of a relationship between variables from large data, and discovering relationships that are not currently explored (Borenstein et al., 2009; Donthu, Kumar, Mukherjee, et al., 2021; Higgins et al., 2003). Meanwhile, a systematic literature review uses a qualitative small data analysis approach to review and summarize the results of the data (Donthu, Kumar, Mukherjee, et al., 2021; Moher et al., 2009).

A probabilistic theory rationalizes the bibliometric analysis. A cumulative benefit distribution that statistically models a stochastic law containing non predefined parameter and is approximated by a skewed or hyperbolic distribution, grounds the probability theory in bibliometrics (Price, 1976). This theory explains that success seems to breed success, and thus, in scholarly publications, Price (1976) theorizes that an article receiving many citations is more likely to be cited more often than a manuscript with few citations. The same applies to the authorship. The theory holds that an author with a significant number of publications is more likely to republish than an author with a few number of publications (Price, 1976). The theory was practically crucial for performing citation frequency analysis, such as Pareto and Zipf distribution, Lotka’s law, and Bradford’s law (Price, 1976; Ravichandra Rao, 1985).

Bibliometric analysis has revealed important debates in business, management, and accounting issues. Influential work in this area includes reviewing academic publications on business intelligence and analytics (BI&A) (Chen et al., 2012),
circular economy and sustainability (Geissdoerfer et al., 2017), the concept of organizational absorbency (Volberda et al., 2010), managerial issues (Ramos-Rodrígue & Ruiz-Navarro, 2004), bibliometric analysis steps for management and organization (Zupic & Čater, 2015), and others. This work adopts the primary technique of bibliometric analysis (i.e., performance and science mapping analyses) and enrichment technique (i.e., network analysis) as explained by Donthu et al. (2021a) to analyze the topics of Indonesian IBs as recorded in the Scopus database.

2.1.1 Performance analysis and research question one
Cobo et al. (2011); Donthu et al. (2021) explain that performance analysis in bibliometric study provides a descriptive analysis that assesses the contributions of research items to some knowledge area. There are at least three metrics for performance analysis, i.e., citation metrics, publication metrics, and citation-publication metrics (Donthu, Kumar, Mukherjee, et al., 2021).

Performance analysis is practically important to assess the recent development of a particular topic or scholarly journal. It analytically examines the backgrounds of authors, institutions, countries and related journals (Donthu, Kumar, Mukherjee, et al., 2021; Donthu, Kumar, Pandey, et al., 2021). Several indicators have been used by researchers to analyze performance, such as productivity and impact measures. The impact and productivity of an academic journal are measured, respectively by the number of citation and the number of publications (M Aria & Cuccurullo, 2017; Donthu, Kumar, Mukherjee, et al., 2021). The performance analysis in this work aims to answer the research question one as follows; RQ 1: How is the development of publications, citations, and authors related to the topics of Indonesian IBs?

2.1.2 Science mapping analysis
Science mapping is an analytical step in creating bibliometric maps that explain how a scientific field is theoretically, intellectually, and socially organized (Cobo et al., 2011b). This investigation is pragmatically substantial for gaining knowledge from the object of a research topic. It identifies and examines the intellectual structure of a research field or a given topic and constructs a social network structure of a particular scholarly community (M Aria & Cuccurullo, 2017). The analysis can be done by constructing the bibliometric maps and creating the graphic image of the maps (N J van Eck & Waltman, 2010). Citation analysis, co-citation analysis, bibliographic coupling, co-author analysis, co-word analysis, and social network analysis are fundamental to science mapping analysis (M Aria & Cuccurullo, 2017; Zupic & Čater, 2015).

2.1.2.1 Citation and co-citation analyses and research question two
Citation analysis is crucial to identify highly interesting journals (Donohue, 1972) and essential to assess the most influential publications and scholarly activities in a research area (Donthu, Kumar, Mukherjee, et al., 2021; Reeves & Borgman, 1983). It is considered sociometric statistics (Wouters & Leydesdorff, 1994), describing
the intellectual connection measured by the citations number. Citation and co-citation analyses are the most objective and relevant approaches to measure the impact of a scholarly publication (Appio et al., 2014; Donthu, Kumar, Mukherjee, et al., 2021).

Furthermore, co-citation investigation assumes that a similar theme arises for publications that are regularly cited together (Donthu, Kumar, Mukherjee, et al., 2021; Hjørland, 2013). The co-citation technique is important for discovering themes in a research area (Cobo et al., 2011b). It analyzes the emergence of domains and specialties of a scholarly publication (Hummon & Dereian, 1989). The co-citation analysis specifically examines the joint occurrence of the analyzed objects in a research field (M Aria & Cuccurullo, 2017). Citation and co-citation unit of analysis including authors, references, journals, country of affiliation, and institution of affiliation (M Aria & Cuccurullo, 2017). Against the citation and co-citation analytical theories, this study aim to address the research question two: RQ2: What are the most influential articles, authors, countries, and affiliations associated with the scholarly publications of Indonesian IB theme?

2.1.2.2 Bibliographic coupling and co-word analyses and research question three

The idea of bibliographic coupling can be found in Kessler (1963). It is a technique that defines a reference element used by two articles as a unit of coupling, and based on this unit two classifications of coupling are made (Kessler, 1963). In recent studies, bibliographic coupling is used to examine co-author associations between researchers citing similar references and journals citing similar references (Cobo et al., 2011b; Gao & Guan, 2009; Zhao & Strotmann, 2008). Bibliographic linking helps to identify thematic clusters based on the citing publications that can explain the topics and recent developments of a topic or a research area (Donthu, Kumar, Mukherjee, et al., 2021).

Furthermore, co-word analysis theorizes the possibility of identifying complex networks and examining network evolution from documents (Callon et al., 1983). Co-word analysis helps in examining the current and future connections between topics in a research area or scholarly publication (Donthu, Kumar, Mukherjee, et al., 2021). Co-word analysis uses keywords or terms from the title, abstract, or document content as a unit of analysis to examine the co-occurrence of terms in a document (M Aria & Cuccurullo, 2017; Cobo et al., 2011a, 2011b). Based on bibliographic coupling and co-word analytical theories, the following research question three aims to be addressed in this work: RQ3: How is the current trend topics associated with the studies on Indonesian IBs?

2.1.2.3 Social network analysis and research question four

Social network analysis can reveal the interactions between authors, their affiliations, and their countries of affiliations in a scholarly publication (Donthu, Kumar, Mukherjee, et al., 2021). In particular, social network analysis helps analyze co-authorship structures by revealing a macro-network of all most-published authors, including the micro-networks linked to them (Eaton et al.,
A macronetwork means a large interconnected network loosely connecting authors on a particular topic in a research area (Eaton et al., 1999), resulting from the co-authorship of scientific papers (Acedo et al., 2006). The social network unit analysis includes authors, affiliations, and countries of institutions (M Aria & Cuccurullo, 2017; Donthu, Kumar, Mukherjee, et al., 2021).

In this study, our social network analysis aims to address research question four:

RQ4: How is the interaction among authors, their affiliations and their countries in regard to Indonesian IB theme?

III. METHODOLOGY

3.1. Data Collection

In this study, the Scopus database was used for collecting relevant data related to critical publications of Indonesian IB theme. Figure 1 describes the data collection steps performed by the authors. An automatic bibliometric data was harvested automatically from the Scopus database.

The authors employed the keywords (Islamic banking) at the first step of the search, which resulted the initial sample of $n=3,004$ documents. Following this, the keyword (Indonesia) was added in the Scopus’ search within the results, subsequent to the $n=958$ documents. The final data was gained from refining the search using the Scopus’ automatic system of limiting the results. In this case, the authors selected:

- the four subject areas (i.e., 1. Business, Management and Accounting, 2. Economics, Econometrics and Finance, 3. Social Sciences, and 4. Arts and Humanities);
- four keywords (i.e., Islamic banks, Islamic banking, Islamic bank and Indonesia);

The search refinement resulted in the final data for the analysis. It was consisted of $n=443$ documents.

Figure 1. Data Collection Steps

Source: Authors’ own.
3.2. Machine Learning Tools
This study used RStudio and VOSviewer for the bibliometric analysis. RStudio is a machine learning requiring languages programming skill for statistical computing and graphical analyses. This study employed bibliometrix and biblioshiny of M Aria & Cuccurullo (2017); Massimo Aria & Cuccurullo (2021). Furthermore, VOSviewer which is developed by van Eck & Waltman (2010) at the Centre for Science and Technology Studies (CWTS), Leiden University, was used for creating graphical networks of some bibliometric analysis, e.g., co-occurrence, co-citations, and co-authorship analyses.

IV. RESULTS AND ANALYSIS
4.1. Descriptive Statistics and Overview to the Sample
The time span of the sampled bibliometric data from the Scopus ranged from 2003 to 2022 with a total of 1049 authors. Of the 443 documents, 91% (403 articles) consisted mainly of journal articles. The remainder were 17 reviews (3.8%), 12 conference papers (2.7%), 9 book chapters (2%), 1 book (0.2%), and 1 editorial (0.2%). Table 1 explains the descriptive statistics of the bibliometric data used in this study.

Furthermore, while the record of 2022 is ongoing at the time of this study, the publication of the Indonesian IB topic has attracted massive attention. Research on this subject has been emerging for almost two decades, particularly as recorded in the Scopus database with a 28.86% annual growth rate of publications (2003 – 2021). Figure 2 shows the annual publication count of Indonesian IBs theme in the Scopus and its annual average citations. The Scopus has been recording the topics since 2003, with the publications starting to increase in 2015 and reaching 96 publications in 2021, while the average citation ranges from 0.0 to 8.3. In 2013, a similar increased pattern between articles (15 publications) and citation (8.30) was found.

The proportion of the authors for the keywords and the sources within the 443 sampled documents is depicted in Figure 3. The Sankey graph illustrates the highest contributors of the Indonesian IBs research, predominantly the authors, their keywords and the publishing outlets. In general, the thicker the flow, the higher the contribution. That is, the Indonesian IBs theme has been predominantly contributed by Ismal R in regard to the flow to the top keywords (i.e., Islamic banks). Meanwhile, the International Journal of Islamic Middle Eastern Finance and Management (IMEFM) is the source with the highest contribution to this research area.
### Table 1.
**Descriptive Statistics of the Sampled Bibliometric Data**

<table>
<thead>
<tr>
<th>Description</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main information about data</strong></td>
<td></td>
</tr>
<tr>
<td>Timespan</td>
<td>2003-2022</td>
</tr>
<tr>
<td>Sources (Journals, Books, etc)</td>
<td>194</td>
</tr>
<tr>
<td>Documents</td>
<td>443</td>
</tr>
<tr>
<td>Average years from publication</td>
<td>3.48</td>
</tr>
<tr>
<td>Average citations per documents</td>
<td>9</td>
</tr>
<tr>
<td>Average citations per year per doc</td>
<td>1,598</td>
</tr>
<tr>
<td>References</td>
<td>22770</td>
</tr>
<tr>
<td><strong>Document Types</strong></td>
<td></td>
</tr>
<tr>
<td>Article</td>
<td>403</td>
</tr>
<tr>
<td>Book</td>
<td>1</td>
</tr>
<tr>
<td>book chapter</td>
<td>9</td>
</tr>
<tr>
<td>conference paper</td>
<td>12</td>
</tr>
<tr>
<td>editorial</td>
<td>1</td>
</tr>
<tr>
<td>Review</td>
<td>17</td>
</tr>
<tr>
<td><strong>Document Contents</strong></td>
<td></td>
</tr>
<tr>
<td>Keywords Plus (ID)</td>
<td>198</td>
</tr>
<tr>
<td>Author’s Keywords (DE)</td>
<td>1120</td>
</tr>
<tr>
<td><strong>Authors</strong></td>
<td></td>
</tr>
<tr>
<td>Authors</td>
<td>1049</td>
</tr>
<tr>
<td>Author Appearances</td>
<td>1270</td>
</tr>
<tr>
<td>Authors of single-authored documents</td>
<td>52</td>
</tr>
<tr>
<td>Authors of multi-authored documents</td>
<td>997</td>
</tr>
<tr>
<td><strong>Authors Collaboration</strong></td>
<td></td>
</tr>
<tr>
<td>Single-authored documents</td>
<td>57</td>
</tr>
<tr>
<td>Documents per Author</td>
<td>0.422</td>
</tr>
<tr>
<td>Authors per Document</td>
<td>2.37</td>
</tr>
<tr>
<td>Co-Authors per Documents</td>
<td>2.87</td>
</tr>
<tr>
<td>Collaboration Index</td>
<td>2.58</td>
</tr>
</tbody>
</table>

*Source: Authors’ analysis via RBiblioshiny.*
4.2. Publishing Outlet Analysis

Analysis of the sources, i.e., publishing outlets, from the sample of 443 publications is crucial to understand the most influential sources (e.g., books, conference proceedings and others) in the topics of Indonesian IBs research. Some indicators, e.g., h-index, g-index, m-index, total citations (TC), number of publications, are representative of the impactful sources.

Table 2 shows the top 10 most influential sources based on impact measurements, number of publications and total number of local citations. The *International Journal of Islamic and Middle Eastern Finance and Management* (IMEFM) is the highest in terms of impact measurement, i.e. h-index 12, g-index 20 and m-index
0.923. This journal is also the leader in terms of the number of publications with 37 articles. Interestingly, when measuring impact, the *Journal of Islamic Marketing* (JIMA) follows with h-index 8, g-index 18 and m-index 0.8 and the *Journal of Islamic Accounting and Business Research* (JIABR) follows with h-index 7, g-index 13 and m-index 0.636. In terms of number of publications, JIMA and JIABR also follow IMEFM with respectively, 35 and 28 publications. Meanwhile, in regards to the total local citations, the *International Journal of Bank Marketing* (IJBM) is the highest with 591 TCs. It is further followed by IMEFM and *Journal of Banking and Finance* (JBF) with accordingly, 447 and 301 TCs.

Furthermore, the information scattering of the sources containing the Indonesian IB issues is shown in Figure 4. It illustrates the law of distribution among the top 10 sources, which in some journals mainly publish the topics of Indonesian IBs, while others are less. Bradford’s Law in Figure 4 identifies 8 journals i.e., IMEFM, JIMA, JIABR, *Journal of Asian Finance Economics and Business* (JAFEB), *Banks and Bank Systems, International Journal of Innovation Creativity and Change* (IJICC), *Humanities and Social Sciences Reviews* (HSSR) and ISRA *International Journal of Islamic Finance* (IJIF), as the core sources for this topic. Those journals have published scholarly articles discussing issues of Indonesian IBs, with the number of articles published ranging from 7 to 37 articles.
Table 2.  
Top 10 Journals Discussing Topics of Indonesian IBs

<table>
<thead>
<tr>
<th>No</th>
<th>Impact measurements</th>
<th>Number of Publications</th>
<th>Total Local Citations (TC)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sources</td>
<td>h-index</td>
<td>g-index</td>
</tr>
<tr>
<td>----</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>1</td>
<td>International Journal of Islamic and Middle Eastern Finance and Management</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Journal of Islamic Marketing</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>Journal of Islamic Accounting and Business Research</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>5</td>
<td>Humanomics</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>Journal of Asian Finance, Economics and Business</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Qualitative Research in Financial Markets</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Economic Modelling</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>European Research Studies Journal</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>ISRA International Journal of Islamic Finance</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Authors' analysis via RBiblioshiny. Table is reproduced using Microsoft Excel.
4.3. Author Analysis
The investigation of author-related matters in a bibliometric study is theoretically important for exploring the influential authors, their affiliations and countries. Table 3 shows the 10 most influential authors (out of 1049 authors) based on impact measurements, number of publications and total number of local citations (LC). Ismal R is the most influential author based on impact measurements (i.e., h-index 6, g-index 7 and m-index 0.462). In regards to the number of publications, Hassan MK and Ismal R marked the highest number of publications with 7 articles. While in terms of total LCs, Jamshidi D made the highest with 70 LCs, followed by Hussin N (66 LCs). In addition, the author’s important collaboration is depicted in Figure 5. It shows 8 important cluster of authors in the publications of Indonesian IBs. The bigger the node, the more the weight connections, which is representative to the authors’ relatedness based on their co-authored documents in a sample. The red, green and blue clusters signify the important co-authorship in the themes of Indonesian IBs.

Furthermore, the top 10 affiliations based on the number of published articles ranging from 13 to 37 articles. The International Islamic University Malaysia (IIUM) has been the leading institution for scholarly publications on this topic with 37 articles. Universitas Indonesia (UI), Universitas Airlangga (UNAIR), Universiti Putra Malaysia (UPM) and University of Malaya (UM) follow IIUM, respectively with 25, 22, 20, and 19 publications. Meanwhile, in terms of corresponding author country, Indonesia was recorded the highest. Figure 6 shows the top 10 countries of corresponding authors with a specific reference to the single country publications (SCP) and multiple country publications (MCP). These countries have different proportions in terms of SCP and MCP. Some are found with a higher SCP compared to their MCP, while others are the opposite. That is, in general, Malaysia and Indonesia lead the corresponding author’s country in the publications of Indonesian IBs. Indonesia is the highest on SCP, while Malaysia is slightly higher than Indonesia on MCP.
Table 3.
Top 10 Authors, Affiliations and Countries Addressing Topics of Indonesian IBs

<table>
<thead>
<tr>
<th>No</th>
<th>Impact Measurements</th>
<th>Number of publications</th>
<th>Total Local Citations</th>
<th>Top Affiliations based on Publications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Authors</td>
<td>h-index</td>
<td>g-index</td>
<td>m-index</td>
</tr>
<tr>
<td>1</td>
<td>Ismal R</td>
<td>6</td>
<td>7</td>
<td>0.462</td>
</tr>
<tr>
<td>2</td>
<td>Aysan AF</td>
<td>4</td>
<td>4</td>
<td>0.571</td>
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<tr>
<td>3</td>
<td>Disli M</td>
<td>4</td>
<td>4</td>
<td>0.571</td>
</tr>
<tr>
<td>4</td>
<td>Hassan MK</td>
<td>4</td>
<td>4</td>
<td>0.667</td>
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<tr>
<td>5</td>
<td>Sufian F</td>
<td>4</td>
<td>5</td>
<td>0.308</td>
</tr>
<tr>
<td>6</td>
<td>Suhartanto D</td>
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</tr>
<tr>
<td>7</td>
<td>Sukmana R</td>
<td>4</td>
<td>6</td>
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<tr>
<td>8</td>
<td>Abduh M</td>
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<td>4</td>
<td>0.273</td>
</tr>
<tr>
<td>9</td>
<td>Aliyu S</td>
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<td>3</td>
<td>0.429</td>
</tr>
<tr>
<td>10</td>
<td>Fianto BA</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Authors’ analysis via RBiblioshiny. Table is reproduced using Microsoft Excel.
4.4. Document Analysis

Document analysis is crucial for identifying the most impactful manuscripts. In this study, it investigates the most influential papers out of 443 samples. The local citation (LC) refers to the citations among the sample while global citation (GC) denotes all the citations that the sample received in the Scopus database. Table 4 explains the top 10 manuscripts based on the LC, GC and most local cited references. Figure 7 visualizes the citation of the sample, showing the relatedness...
of the manuscripts is based on the frequency they cite each other. The bigger the nodes, the higher the citations received by a manuscript in the sample.

Of the 443 documents, Beck’s et al. (2013) work entitled ‘Islamic vs. conventional banking: Business model, efficiency and stability’ received the highest citations of both GC and LC with 668 and 66 citations, correspondingly. In GC, Johnes’s et al. (2014) study titled ‘A comparison of performance of Islamic and conventional banks 2004–2009, and Wilson’s et al. (2013) work entitled ‘Crescent marketing, Muslim geographies and brand Islam: Reflections from the JIMA Senior Advisory Board’ follow, respectively with 157 and 148 citations. Meanwhile in LC, the work ‘A contemporary survey of Islamic banking literature’ authored by Hassan & Aliyu (2018) and ‘Islamic banking and economic growth: the Indonesian experience’ by Abduh & Azmi Omar (2012) follow with the same 15 LCs.

Furthermore, in terms of local references of the sample, ‘Exploring the Ethical Identity of Islamic Banks via Communication in Annual Reports’ of Haniffa & Hudaib (2007) is the most cited reference by the sample with 25 citations. Maali’s et al. (2006) ‘Social reporting by Islamic banks’ and Metawa & Almossawi’s (1998) ‘Banking behavior of Islamic bank customers: perspectives and implications’ follow with 21 and 17 citations, respectively.
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Table 4.  
Top 10 Manuscripts (Continued)

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<th>No</th>
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Source: Authors’ analysis via RBiblioshiny. Table is reproduced using Microsoft Excel.
4.5. Keyword Analysis

Keyword analysis uncovers important topics in a specific field. In this study, this examination reveals critical themes extracted from 198 keywords plus and 1120 author keywords generated from the sample. Figure 8 describes the top 100 keyword co-occurrences in the sample. The larger the nodes, the more common the words are found in the sample. It shows how the highly used keywords (i.e., Islamic banking in purple cluster and Indonesia in green cluster) connect to other important keywords used at least 4 times in the total of 1318 sampled keywords.

Furthermore, thematic analysis can best map the sampled keywords into 4 important quadrants (Massimo Aria et al., 2022). Figure 9 shows the thematic map of the most highly used keywords within the sample of 1120 author keywords. The keywords grouped in the upper right quadrant (e.g., AAOIFI, financial accounting standards, among others) represent the motor themes. The keywords in the lower right quadrant (e.g., religiosity, efficiency, profitability, financial performance and others) are indicative of the basic theme. The keywords in the lower left quadrant (e.g., performance evaluation, falah and others) denote emerging or declining theme. While the keywords clustered in the upper left quadrant (e.g., financial inclusion, Islamic marketing, sustainable development, pls (profit and loss sharing) financing, and others) are representational to the highly specialized or niche theme. These themes are representative of the critical issues in the topics of Indonesian IBs as sampled from the Scopus database.

Furthermore, Figure 10 captures the trend topics that emerged from the author keywords in the sample, primarily the keywords from the manuscripts published between 2010 and 2020. The blue line indicates the beginning and ending year of a word occurrence. The blue circle shows the median word occurrence frequency. The biggest the circle, the highest manifestation of the word. That is, even if a keyword shows up with the longest blue line, it doesn’t mean that the word

Source: Authors’ analysis using VOSviewer of van Eck & Waltman (2010). Descriptive statistics; 282 manuscripts included in the analysis, 28 clusters, 481 links, normalization used association, nodes weight used citations.

Figure 7.
Visualization of the Sample’s Citation Analysis
is prominent in the sample. It only refers to the differences in the frequency of occurrence. For instance, the ‘economic growth’ keyword has the longest blue line, but the blue circle is small compared to the ‘Indonesia’ keyword. This means ‘Indonesia’ keyword is higher in terms of its occurrence compared to the ‘economic growth’ keyword.

Additionally, the keywords in the top panel of Figure 10 represent the most recent keywords used by the authors in the recent publications. The keywords such as ‘PLS financing’, ‘non-Muslim customer’, ‘behavioral intention’, ‘corporate social responsibility’, ‘financial performance’, ‘attitude’, ‘religiosity’ and others, have recently appeared between 2019 and June 2022. These keywords support the thematic map which are indicative to the most important issues in Indonesian IBs theme.

Source: Authors’ analysis using VOSviewer of van Eck & Waltman (2010). Descriptive statistics; 69 keywords included in the analysis (4 min. occurrences), 11 clusters, 289 links, 293 total link strength, normalization used association, nodes weight used citations.

Figure 8.
Author Keywords Co-occurrences
Evaluating Indonesian Islamic Banking Scholarly Publications: A Data Analytics

Source: Authors' analysis via RBiblioshiny. Descriptive statistics; 69 keywords included in the analysis (4 min. occurrences), 11 clusters, 289 links, 293 total link strength, normalization used association, nodes weight used citations.

Source: Author Analysis with bibliometrix shiny app. List of stop words (pakistan, islamism, malaysia, bangladesh, Islam, banking, banks). List of synonym words (Islamic bank, Islamic banks, Islamic banking). Parameters; number of words was set 150, min cluster frequency was set 5, clustering algorithm employed Walktrap of Pons & Latapy (2005).

Figure 9.
Thematic Map of the Sampled Keywords

Figure 10.
Trend Topics Generated from the Sampled Keywords
4.6. Bibliographic Coupling

Bibliographic coupling analysis reveals the relationships among the sampled documents based on the number of references they share. This paper used the normalized citations to cluster the sample. This normalization is critical to correcting the fact that previously published manuscripts had more time to gain citations compared to the newly published works (Nees Jan van Eck & Waltman, 2018). In this way, the important and current topics of a specific area are documented. Figure 11 is the visualization of bibliographic coupling of the sample 443 documents. The bigger the nodes, the higher the normalized citation is the respective works. In details, the number of manuscripts grouped in each cluster is as follows, 52 manuscripts in cluster 1 (red), 46 papers in cluster 2 (green) gathers 38 scholarly works in cluster 3 (blue), 36 academic articles in cluster 4 (yellow corn), and respectively 6, 5 and 3 manuscripts in cluster 5 (purple), cluster 6 (turquoise blue), and cluster 7 (orange).

Source: Authors’ analysis using VOSviewer of van Eck & Waltman (2010). Descriptive statistics; 186 documents included in the analysis, 7 clusters, 2107 links, 1291.17 total link strength, normalization used modularity, nodes weight used normalized citations.

Figure 11.
Bibliographic Coupling of the Sample

V. DISCUSSION AND CONCLUSION

The scientific productivity of the sample in this study shows that there are 1049 authors in the sample with the contribution to the article publication ranging from 1 to 7 articles. Of the 1049 authors, 908 (87%) contributes to 1 publication and only 0.2% (2 authors) contributes to the maximum publication of 7 articles. The value of Lotka’s law that considers a research area as a standalone research domain ranging from 1.78 to 3.78 for most disciplines (Munim et al., 2020; Pao, 1986). The estimated value of Lotka’s law in this study is 2.87, falling in between Pao’s (1986) estimation. Hence, Indonesian IBs topic is a standalone research domain.

The current development of publications, citations, and authors in the topics of Indonesian IBs (i.e., addressing RQ1) is evident in Table 2. The publication
of this topic is pioneered by IMEFM based on both impact measurements and number of articles, and is led by IJBM in terms of TC. Furthermore, as shown in Table 3 (i.e., answering RQ2), Ismal R, Hassan MK and Jamshidi D, are the top authors of this field, which are measured respectively by impact measurements, number of publications and total LCs. The work of Beck et al. (2013) is impactful to this field based on GC and TC indicators, while the study of Haniffa & Hudaib (2007) is influential in terms of the highest cited reference. In addition, IIUM leads the publication of this topic with its highest number of articles, while in terms of countries of affiliation, Indonesia and Malaysia mark the highest contribution to SCP and MCP, correspondingly.

The current trend in the topics of Indonesian IBs (i.e., answering RQ3) is discovered in Figure 8, Figure 9 and Figure 10. Keywords such as, PLS financing’, ‘non-Muslim customer’, ‘behavioral intention’, ‘corporate social responsibility’, ‘financial performance’, ‘attitude’, and ‘religiosity’, are representative of the current issues in Indonesian IBs theme. Meanwhile, the interaction among the authors (i.e., answering RQ4) is evident in Figure 7, showing how the authors in the sample cite each other.

5.1. Potential research topics
The normalized number of citations of a paper, i.e., based on a paper’s number of citations divided by the average number of citations of all manuscripts published in the same year that are included in the data (Nees Jan van Eck & Waltman, 2018), is relevant to measure the influential manuscripts, correcting the fact that an older paper has a longer times to receive citations. This basis grounds the following discussion addressing the relevant topics for future research in the field of Indonesia IBs. The bibliographic coupling as in Figure 11 is further analyzed against the finding from the keyword analysis (i.e., the thematic map in Figure 9 and the trend topics in Figure 10). This approach results in some potential topics for further investigation.

5.1.1. Customer related issues
Customer satisfaction, customer loyalty and consumer behavior are among critical basic and niche themes (i.e., Figure 9) in the field of Indonesian IBs research. Cluster 1 (red) in Figure 11 represents Tabrani’s et al., (2018) evidence of Indonesian IB’s customers in regards to trust, commitment, intimacy and loyalty. This work finds that trust among Indonesian IBs customers has a significant association with engagement and customer intimacy. However, the generalizability of the study’s finding is limited due to the sample size that does not representative of the population. That is, a future study may refer to this work to understand how trust enhances customer loyalty and enlarge the sample size for accurate generalization.

5.1.2. Risk management, dual market competition and spin-off
Risk management is among critical trend topics found from the sample (i.e., Figure 10). This associates with Risfandy et al. (2022) (Figure 11, cluster 2 in green), who
consider Indonesia as one of their samples to empirically investigate IBs stability in dual market competition. The study suggests that competition only impacts on the CBs, not the IBs, yet IBs are recommended to have sufficient capital buffer. This issue demands further investigation in future studies, given capital adequacy is one of the motor themes (i.e., see Figure 9) of this research field.

Future works on Indonesian IBS risk management can consider cluster 4 (yellow corn of Figure 11). It is representative of Indonesian conventional banks (CBs) and IBs differences of intermediation, fee-based service activity and efficiency (Hardianto & Wulandari, 2016), Indonesian IBs practices of liquidity risk management (LRM) (Ismal, 2010), and a Malmquist analysis investigating the changes in productivity and risk management in Indonesian banking sector, including IBs (Hadad et al., 2011). These studies are critical to the basic theme (i.e., Figure 9) of Indonesian IBs topic.

The purple cluster of Figure 11 represents Nur Rianto Al Arif’s et al. (2017) work on Indonesian IBs spin-off. This study contributes to analyzing the IBs performance before and after spin-off to draw critical policy recommendation. Hence, future studies are advised to refer to the study of Nur Rianto Al Arif’s et al. (2017) to gain better understanding of IBs performance prior to the spin off.

5.1.3. Political issues and Economic Growth
Cluster 2 (green) of Figure 11 highlights the work of Yunan (2020), examining the impact of corruption on IBs. The study takes Indonesia as one of the samples and finds that profitability and soundness of IBs are significantly influenced by corruption. However, the corruption indicators used by the study is limited to the use of Transparency International and the World Bank. Future studies are encouraged to employ other corruption benchmarks that best match for the IBs nature of business.

Furthermore, economic growth is among the trend topics in the field of Indonesian IBs (i.e., Figure 10). This trend topic may explain cluster 7 (orange) of Figure 11, which represents Soedarmono’s et al. (2017) investigation of procyclicality of loan loss provisions in IBs, taking Indonesian IBs as one of the samples. They find that IBs loan loss provisions are generally procyclical, in particular, risk provisioning falls when economic growth is stronger. This topic further demands a critical debate in the future studies.

5.1.4. Informational disclosure, performance evaluation, and religiosity
Content analysis and corporate social responsibility topics are grouped as emerging themes in Indonesian IBs research (i.e., Figure 9). This is relatable to cluster 3 (blue) of Figure 11, which represents Amran’s et al. (2017) comparison of Indonesian and Malaysian IBs in social responsibility (CSR) disclosure. The study finds an emerging trend of CSR reports from both sampled IBs in Malaysia and Indonesia. However, the time-frame limits the study and thus, opens spaces for future studies. It is possible to include longer time-frame to establish historical analysis on how CSR is reported by IBs.
Furthermore, performance evaluation, religiosity, *shariah* (Islamic law), *faluh* (worldly and hereafter wellbeing), are among the emerging and basic themes identified in the topics of Indonesian IBs. These keywords are further explained in Hudaefi & Badeges’ (2021) text mining analysis of *maqasid al-Shariah* in Indonesian IBs performance (i.e., Figure 11 blue cluster). This work is important in the understanding of Indonesian IBs in disclosing the information about *maqasid al-shariah* in their business activities communicated in the annual reports. However, to what extent *maqasid al-shariah* is measured against the critical business aspects remains unexplored. Thus, future works are deemed necessary to address this topic.

In addition, the turquoise blue cluster in Figure 11 is also representative of *shariah*-compliant issues in regard to IBs performance. That is, Shah’s et al. (2021) econometric methodology for IBs Shariah-compliant duration provides a critical novelty of the impact of rates of return, benchmark rates and managerial skills of Islamic bank risk managers on the durations of assets and liabilities. This method is applicable for future studies.

**REFERENCES**


