IMPLEMENTATION OF SIGNALING THEORY IN FINANCIAL MANAGEMENT:
A BIBLIOMETRIC ANALYSIS

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ABSTRACT

**Purpose:** The objective of this research is twofold: (1) to elucidate the progression of studies pertaining to the application of signaling theory in financial management, and (2) to scrutinize the bibliometric analysis of the implementation of signaling theory in financial management.

**Method:** The employed technique is clustering, overlay, and density of bibliometric analysis. The utilized tools include publishing platforms such as Publish or Perish, Google Scholar, and VosViewer.

**Results and Conclusion:** The research findings indicate a limited amount of literature exploring the utilization of signaling theory in financial management. This is evident in the minimal growth in the number of papers published between 1994 and 2023, with an average of only 1 to 3 papers per year.

**Research Implication:** Concerning the primary keywords that commonly arise in this study, specifically "theory" and "signaling theory", there exist five clusters of keywords with the utmost frequency of occurrence. Applying signaling theory in financial management has been demonstrated to enhance investors' propensity to allocate their capital.

**Originality/Value:** The role of financial management is vital in determining the company's profitability. Implementing financial management using the signaling theory approach is a viable method to achieve profitability. The theory of signaling is instrumental in conveying signals to investors regarding the financial state of the company. The findings of this study can offer valuable understanding regarding the implementation of signaling theory in financial management, thereby serving as a basis for considering the utilization of this theory.

**Keywords:** Implementation, Financial Management, Signaling Theory.

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IMPLEMENTAÇÃO DA TEORIA DA SINALIZAÇÃO NA GESTÃO Financeira: UMA ANÁLISE BIBLIOMÉTRICA

RESUMO

Objetivo: O objetivo desta pesquisa é duplo: (1) elucidar a progressão dos estudos relatios à aplicação da teoria da sinalização na gestão financeira e (2) examinar a análise bibliométrica da implementação da teoria da sinalização na gestão financeira.

Método: A técnica empregada é o agrupamento, a sobreposição e a densidade da análise bibliométrica. As ferramentas utilizadas incluem plataformas de publicação como Publish or Perish, Google Scholar e VosViewer.

Resultados e conclusões: Os resultados da pesquisa indicam uma quantidade limitada de literatura explorando a utilização da teoria da sinalização na gestão financeira. Isso fica evidente no crescimento mínimo do número de artigos publicados entre 1994 e 2023, com uma média de apenas 1 a 3 artigos por ano.

Implicações para a pesquisa: Com relação às palavras-chave primárias que comumente aparecem neste estudo, especificamente "teoria" e "teoria da sinalização", existem cinco grupos de palavras-chave com a maior frequência de ocorrência. Foi demonstrado que a aplicação da teoria da sinalização na gestão financeira aumenta a propensão dos investidores a alocar seu capital.


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1 INTRODUCTION

The role of financial management is pivotal in shaping business strategies and achievements. The area of financial management in a business encompasses activities such as sourcing funds, allocating and distributing funds, distributing profits, monitoring funds, and evaluating income and expenditure. Company financial management is primarily concerned with maximizing the value of the company in relation to its share prices on the capital market. This is achieved through strategic investment decisions, dividend policies, and effective resource management (Nurhayati, 2017). The implementation of effective company management not only affects company prices but also positively influences company relations with consumers, contributes to the achievement of company sustainability, and helps establish a favorable reputation for the company (Ompusunggu & Irenetia, 2023). Both Mulyana et al. (2023) and Digdowiseiso (2023) outline multiple functions of financial management in
companies. These functions encompass decision-making regarding investments, funding, and dividend allocation based on the company's profits.

A financial manager is the individual who is accountable for overseeing the financial management of a company. He or she must fulfill five key aspects of management in order to effectively carry out their role. The five aspects include: (1) coordinating predictions and financial planning for the company's future; (2) making investment and funding decisions, such as optimizing sales levels, setting asset targets, and determining strategic steps for funding; (3) ensuring operational efficiency through effective communication and interaction with employees; (4) increasing investment opportunities through involvement with the capital market; and (5) identifying operational and financial risks and developing risk management strategies to minimize them (Mulyanti, 2017; Digdowiseiso, 2023). Company operations and activities involve both internal and external parties, necessitating collaboration and communication. The external parties involved in this context encompass shareholders, government entities, creditors, legal professionals, auditors, and environmental observers (Sukamulja, 2021; Digdowiseiso, 2023). Hence, it is imperative to establish a theoretical foundation and adopt an approach to the financial management of companies that is both comprehensive and cooperative with multiple stakeholders.

Signaling theory is a method that facilitates the incorporation of company financial management with external entities. Signaling theory facilitates communication between internal stakeholders of the company, typically represented by financial managers, and external stakeholders such as investors, capital investors, or the general public. Its purpose is to convey information about the company's financial status. The signal in question pertains to information regarding the company's internal management strategy aimed at fulfilling the desires of capital owners. This information serves as a crucial determinant for investors when making investment decisions regarding a company (Putri, 2020; Katterbauer et al., 2022; Neto, 2023; Digdowiseiso, 2023). This theory adequately addresses the requirements of the company's internal stakeholders with regards to the company's prospects, taking into account that the company's management has greater influence over the circumstances and forecasts of prices and business operations in the future. Managers can utilize financial reports as a means to communicate this signal, which outlines the efficacy of implementing company strategies. This enables investors to gauge the extent to which the company can meet its future objectives. The information derived from signaling theory can have both positive and negative implications. A positive signal signifies that the company is experiencing a rise in profits, whereas an adverse signal indicates a decline in profits for the company (Sari et al., 2023; Digdowiseiso, 2023).
In addition to facilitating external parties in assessing the company's condition, financial management based on signaling theory also serves as an incentive for company managers to enhance company performance, thereby maintaining a positive reputation among investors. Another aspect communicated by companies when implementing signaling theory in financial management is good corporate governance (GCG). A favorable GCG status of a company serves as a compelling factor for investors to allocate their capital. This is because GCG indicates that the company has strong financial performance. As a result, it serves as a favorable indicator that can boost company stock prices and influence investors' inclination to invest their capital (Mumtazah & Purwanto, 2020; Digdowiseiso et al., 2022). Novitasari et al. (2020) suggest that signaling theory can reduce the presence of unequal information between the company's internal and external stakeholders. Judging from the role of signaling theory in corporate financial management and improving company performance, a study is needed on how far this theory is applied in financial management in a company or institution. Hence, the objective of this research is to (1) elucidate the progression of studies concerning the utilization of signaling theory in financial management and (2) conduct a bibliometric analysis of the practical application of signaling theory in financial management. The findings of this study can offer valuable understanding regarding the implementation of signaling theory in financial management, thereby serving as a basis for considering the utilization of this theory.

2 RESEARCH METHODS

This research employs a bibliometric analysis approach utilizing VosViewer and publish or perish software. Bibliometric analysis relies on co-occurrence mapping as its methodology. This approach seeks to discern the interconnections among keywords by categorizing scientific articles according to document type, source type, publication year, subject area, and title that exhibits the highest level of activity in the study (Kuzior & Sira, 2022). The data utilized in this research comprises theses, dissertations, scientific journals, scientific proceedings, and books. This bibliometric study utilizes metadata analysis to offer insights into the comparison of research findings discussed in the existing literature. The instruments employed in this study are enumerated in Table 1.
Table 1

Research software

<table>
<thead>
<tr>
<th>No</th>
<th>Tool</th>
<th>Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Publish or Perish and google scholar</td>
<td>Collection and selection of research data</td>
</tr>
<tr>
<td>2</td>
<td>VosViewer</td>
<td>Bibliometric analysis with clustering, overlay</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and density models</td>
</tr>
<tr>
<td>3</td>
<td>Ms. Word</td>
<td>Writing research results in articles</td>
</tr>
</tbody>
</table>

Source: Authors’ analysis (2023)

The methodology employed in this bibliometric study is derived from the research conducted by Tamala et al. (2022) and encompasses the subsequent step:

(1) Determine the research scale in order to establish a precise research trajectory. The process of identifying this scale involves ascertaining the criteria for selecting papers suitable for bibliometric analysis. The requirements for the paper include the use of specific keywords such as "implementation", "application", "signal theory", "signaling theory", and "financial management". Additionally, the paper should be written in both Indonesian and English languages in order to enhance the chances of finding relevant research findings on the intended topic. (b) The publication years span from 1990 to 2023, allowing for an examination of the evolution of trends in signaling theory issues. (c) The research location encompasses a universal scope, enabling the author to gain insights into the application of signaling theory in diverse conditions.

(2) Gathering bibliometric data. Currently, the author examines paper data using publish or perish software. To ensure data quality, the author also conducts data selection by the software developed according to predefined specifications. If the data is deemed to have been appropriately chosen, proceed with extracting the data in .RIS format for utilization as material in bibliometric analysis using the VosViewer software.

(3) Conducting bibliometric analysis utilizing three models. The initial model takes the form of clustering, with the objective of categorizing groups of keywords based on their highest frequency and intensity of occurrence. The second and third models, on the other hand, utilize overlay and density visualization techniques to enhance the outcomes of the clustering analysis. Figure 1 illustrates the procedure.
3 RESULTS AND DISCUSSION

3.1 DEVELOPMENT OF IMPLEMENTATION OF SIGNALING THEORY IN FINANCIAL MANAGEMENT

Signaling theory is crucial for conveying internal company information to external entities. Such a function necessitates a harmonious integration of studies focused on the application of signaling theory in the realm of financial management. This procedure serves to ascertain the optimal methodology for implementing the theory. Furthermore, given the extensive body of research on this subject, it can be utilized as a point of reference for evaluating the originality and ingenuity of signaling theory in the field of financial management. Nevertheless, the authors conducted an investigation using the Google Scholar literature search engine and discovered that only 11 papers focused on the implementation of signaling theory in financial management between 1993 and 2023. The paper was published between 1993 and 2023. The topic has garnered a total of 740 citations, averaging 25 citations per year and 2 citations per paper, indicating significant reader interest. Each paper has an average of 2 authors. The author's productivity is ranked at number 8, as evidenced by an H-index of 8.
value signifies that there are 8 papers authored by the individual that have been cited a minimum of 8 times. The matrix data is presented concisely in Table 2.

Table 2

*Citation matrix*

<table>
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<tr>
<th>Citation matrix</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of publication</td>
<td>1993 - 2023</td>
</tr>
<tr>
<td>Citation year range</td>
<td>30 years</td>
</tr>
<tr>
<td>Paper</td>
<td>11 papers</td>
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<tr>
<td>Total citations</td>
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<td>Citations per year</td>
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<tr>
<td>Citations per paper</td>
<td>67 citations/paper</td>
</tr>
<tr>
<td>Author per paper</td>
<td>2 authors</td>
</tr>
<tr>
<td>H index</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: Authors’ analysis (2023)

The development of papers discussing signaling theory in financial management is also not considered rapid. From 1993 to 2023, the number of publications on this topic is only around 1 to 3 papers. The dynamics of the development of this paper are presented by the graph in Figure 2.

Figure 2

*Quantity of paper related to signaling theory*

![Graph showing quantity of papers related to signaling theory from 1993 to 2023.]

Source: Authors’ analysis (2023)

3.2 BIBLIOMETRIC ANALYSIS OF IMPLEMENTATION OF SIGNALING THEORY

The initial bibliometric analysis is demonstrated through the outcomes of the clustering analysis, which are depicted in Figure 3. To enhance the readability of clustering analysis results, it is important to consider several key symbols. Firstly, nodes represent keywords, and
the size of the node's background indicates the frequency of the keyword's occurrence. Secondly, lines represent the relationship between keywords, and shorter line sizes indicate stronger connections. Thirdly, the size and clarity of the writing reflect the frequency of the keyword. Lastly, color is used to classify keywords based on their proximity class. According to this symbolization, it seems that the two most commonly occurring keywords in studies are "signaling theory" and "theory".

**Figure 3**

*Clustering analysis*

Figure 3 reveals the presence of five keyword clusters. The initial cluster is depicted in red and consists of six keywords: "dividend", "firm", "literature", "manager", "review", and "signaling". The second cluster is represented by the color green and consists of five keywords: "annual report", "financial market evidence", "profitability indicator", "signal", and "voluntary disclosure". The third cluster is represented by the color blue and contains two keywords: "equilibrium" and "theory". The fourth cluster comprises two keywords, specifically "financial manager" and "signaling theory," which are depicted in yellow. The fifth cluster consists of two keywords, specifically "financial institution" and "study", and is represented by the color purple.
Meanwhile, Figure 4 demonstrates an additional analysis that reinforces the information about the frequency of the keywords "theory" and "signaling theory" through overlay analysis. In the previous analysis, color was used to categorize groups of keywords. However, in the overlay analysis, color gradations ranging from blue to yellow are used to indicate the frequency of a keyword in the topic of discussion. The more frequently a keyword appears, the node behind it will turn yellow. Conversely, the less frequent the keyword appears, the node behind it will become more purple. Based on these provisions, it can be inferred that the terms "theory" and "signaling theory" are the most frequently observed keywords.

**Figure 4**

*Overlay analysis*

The next analysis is based on density, through the density visualization in Figure 5, it can be seen that the total number of keywords with the most frequent occurrences is 17 keywords. The main keywords consist of "theory" and "signaling theory", while the accompanying keywords consist of "literature", "signaling", "annual report", and "dividends"
The importance of signaling theory in financial management suggests that companies or institutions should ideally incorporate this theory into their management practices, particularly in the financial sector. This study demonstrates that the application of signaling theory in financial management can enhance profitability, similar to the research conducted by Bini et al. (2010) on the utilization of signaling theory in profitability management. The profitability is stimulated by the implementation of financial management practices that adhere to the principle of transparent financial information, which serves the purpose of indicating the company's financial state. Company financial management encompasses the processes of allocating financial resources, implementing financial plans, and assessing and distributing financial reports. According to a study conducted by Bini et al. (2010), there is a positive correlation between the distribution of company financial reports, specifically the publication of profitability, and the profitability generated by the company. The establishment of this positive correlation arises from the dissemination of profitability data, which serves as a favorable indication to investors, consumers, and the government.

The favorable signal perceived by investors has the capacity to stimulate increased capital investment in the company, enabling the company to utilize these funds for the development of profitable products or services. Conversely, in the realm of capital markets,
companies can earn trust, thereby increasing their chances of securing greater funding for company growth. The same principle applies to favorable signals received from consumers, as these signals enhance the company's reputation and encourage consumers to choose its products or services, ultimately leading to increased profitability. The government views a company's positive signals as an indication of economic growth in a region. Consequently, the government will proactively implement supportive policies to bolster this growth.

The research conducted by Akorsu (2014) demonstrates the beneficial effects of implementing signaling theory in financial management. This implementation is categorized into two distinct strategies, specifically targeting corporations and financial institutions. Primarily, the application of signaling theory to corporations revolves around utilizing low prices as a signal to allure prospective investors. Nevertheless, Ghanaian financial institutions, which favor employing higher levels of debt capital in their funds to enhance investment capacity, will experience a decline in cash flow as they mature. Eldomiaty et al. (2007) conducted a study that included the disclosure of financial conditions. Their research revealed that the debt ratio, which is the average amount of debt relative to assets, is a positive indicator for companies with medium systematic risk. The signal is determined by various factors, including liquidity, profitability, timing of equity issuance, and financial flexibility. Optimal performance across all of these factors will serve as a positive indicator of the viability of a lending decision. Additionally, these signals will enable the company to generate increased revenue from investments in the stock market.

4 CONCLUSION

The research findings indicate a lack of progress in the study of implementing signaling theory in financial management. This is evident from the limited growth in the number of papers published between 1994 and 2023, with an average of only 1 to 3 papers per year. The predominant terms in this study are "theory" and "signaling theory", with five distinct clusters of keywords exhibiting the highest frequency of appearance. Applying signaling theory in financial management has been demonstrated to enhance investors' propensity to invest capital, consequently bolstering the company's profitability.
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