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What Factors Affect Investment Efficiency? A Co-citation Analysis

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Abstract Nowadays, in the context of a globalized economy, businesses have more and more opportunities to participate in investment projects, especially in developing countries. However, most enterprises, still have a lack of understanding and awareness of the potential and benefits that investment can bring to them, therefore they have been meeting underinvestment or overinvestment problem. How enterprises make investment efficiency decisions is a matter of great concern. The aim of this research is to investigate the factors that affect firm's investment efficiency. A total of 36 investment efficiency research articles from the leading Social Science Citation Index (SSCI) journals were cited. By using methods of citation analysis, statistical analyses including factor analysis, and multi-dimensional scaling, this study identifies four research trends on investment efficiency: financial reporting quality; board gender diversity; ownership structure; and corporate social responsibility (CSR). The findings of this study contribute to providing an overview of factors that influence investment efficiency. The results of this paper not only open more interesting future research topics but also may help policymakers establish effective strategies in investment projects as well as motivate the growth of economics, especially in emerging markets.

Keywords Board Gender Diversity, Co-citation Analysis, Corporate Social Responsibility (CSR), Financial Reporting Quality (FRQ), Investment Efficiency and Ownership Structure

1. Introduction

Investment is a key activity that determines the economic growth potential of an enterprise. Foreign Direct Investment (FDI) plays a crucial role for all countries around the world. For developing nations, FDI inflows are especially essential for development and international economic integration because they supplement capital, technology, management capacity, business ability, and participation in global supply chains with an external force.

In recent years, in developing countries, the labour force has increased, and integrating into extremely powerful global markets along with effective macroeconomic policies have improved the growth of economics as well as created large investment opportunities. This is why the economic attention is rapidly turning to these nations. According to a report by the United Nations Conference on Trade and Development (UNCTAD), in 2020, developing nations accounted for 2/3 of total global FDI, up from nearly half in 2019. Notably, these countries witnessed the strongest increase in FDI, amounting to 424 billion USD in the period from January to June 2021 - more than 3 times higher than during the pandemic period of 2020.

The academic literature has considered the investment efficiency in businesses and their managers since at least the 1970s. From the perspective of agency theory, Jensen & Meckling [35] first mentioned the motivations of managers to make investment decisions. Recently, many investment

studies have been carried out in many research fields. It means that investment efficiency is extremely important for any business to achieve the purpose of investment. As a result of globalization, given the enormous numbers of publications on investment efficiency in international business has also been increasing [10, 29].

Despite the series of research articles on investment efficiency in international business, we do not know exactly what kinds of research have been done and the main factors that positively influence investment performance. In a globalized economy, businesses have more and more opportunities to invest, especially in developing countries. How enterprises make investment efficiency decisions is a matter of great concern. The aim of this study explores the factors that influence on firm's investment efficiency. Our methodological approach, co-citation was used to find the factors related to investment efficiency from 36 publications in 12 top economic journals ranked by Web of Science from 1999 to 2021.

The nature of our study is to explore the trends of prior documents in this area. Consequently, the paper did not test any hypothesis as well as did not analyze the findings by model regression analysis. However, the large number of articles together with the employing co-citation method can help us to explore the factors that affected investment efficiency in emerging markets.

To our knowledge, it is the first study displaying comprehensive aspects of investment efficiency research using co-citation analysis. The identification of relevant publications and authors is used to investigate general assessments of investment research. Based on the finding, we give sources of reference for scholars in this field, especially for investment decisions. Besides, our findings also help policymakers to have an objective view for making investment decisions. Furthermore, understanding these elements will help developing countries promote their advantages and build up their competitiveness to attract FDI.

The remainder of this study is carried out as follows. Section 2 presents relevant theories and previous works of literature. The design of the research and sample selection procedure is explained in section 3. The findings are provided in section 4, and section 5 concludes this study.

2. Literature Review

2.1. Agency Theory

Agency theory was first introduced by Alchian & Demsetz [5] who highlighted that contracts were used to control the firm's activity in order to facilitate voluntary exchange. The agency theory suggests how to best organize relationships in which one party (principal) determines the work and another (agent) performs it. As proposed by agency theory, managerial goals might be different from shareholder goals. Hence, Agency problems is a revealing of the conflict of interest between shareholders and managers as shareholders (principals) hire managers (agents) to make decisions in the shareholders' best interests. However, theoretical postulations suppose that human beings are often self-interested and tend to have conflicts of interest in any cooperative activities [34]. Agency theory insists that, in imperfect markets, managers will attempt to enhance their benefit at the cost of the firm's shareholders. Agents are likely to do it for their self-interests rather than for the best benefit of the firm due to asymmetric information. Managers (agents) have a competitive advantage over owners (the principals) in terms of information within the organization. Managers manipulate essential information to maximize their benefits at the expense of the owners [31]. Evidence of self-interested managerial behavior represents through the consumption of some company resources and the avoidance of optimal risks, such as ignoring profitable opportunities in which firms' shareholders would rather them invest.

2.2. Investment Efficiency

Investment efficiency might be defined as all the benefits obtained from the investment includes socio-economic benefits, benefits for investors and all related parties. In investment activities, investors spend their capital to form and supplement necessary assets through the implementation of projects to attain business goals. When a project achieves its aim, it means that the investment efficiency is reached.

In a review of prior literature, we summarized the main research streams of this research subject. By using co-citation analysis, a number of interesting trends related to investment efficiency were found, in which there are four most prominent research trends include financial reporting quality; board gender diversity; ownership structure; and corporate social responsibility (CSR).

Firstly, there has been a lot of research measuring the association between investment decision-making and accounting information quality. For instance, McNichols & Stubben [46] suggested that enterprises invest until the marginal profit equals the marginal cost of the investment to optimize their values. They also showed the higher quality of accounting information quality, the lower over-investment or under-investment as higher quality of accounting information results in lowering information asymmetry between outside investors and managers. In addition, many scholars [13, 14, 26, 51] also continue to prove that accounting information quality could help managers make better investment decisions by identifying projects more effectively and providing more accurate accounting information to internal decision-makers. Secondly, the research stream is human resources, especially senior staff. The ability as well as the experience and professional qualifications of the board of directors who make investment strategies [49]. Board gender diversity has been promoted worldwide to strengthen corporate governance mechanisms for the past three decades [57]. Therefore, it is not surprising to see increasingly significant numbers of studies linking gender diversity in the boardroom to firm-level investment

decisions. For example, in the discussion of the role of female directors in monitoring risks, [17, 40] concluded that board diverse gender is more likely to mitigate the excessive risk-taking in R&D investment decisions. Recently, [33, 63] also figured out that board diverse gender decreases over-investment tendency and risk exposure triggered off by the overconfident attitudes of CEOs. It is completely consistent with the finding of Barber & Odean [7] that female directors will differently influence investment efficiency since they are less likely than males to show their overconfidence. In particular, female directors have a tendency to avoid risky investment opportunities. Thus, companies managed by female CEOs have less volatile earnings and lower leverage compared to firms with male CEOs [28]. In the same vein, [1] further found a negative relationship between gender-diverse board and information asymmetry. These findings are indicative of the negative relationship between board gender diversity and the level of investment efficiency.

Thirdly, a great number of documents about the impact of CSR on investment efficiency have also been performed. Following Dhaliwal et al., [24], CSR was described as a firm's voluntary commitment to engage organizations that go beyond compliance and focus on a variety of social challenges, including carbon neutrality, recyclable products, safe working conditions, and a community greening.

Erhemjamts et al,. [27] suggested the important role of CSR in deciding firms' investment behaviour and project efficiency. They provided strong evidence that the companies with a high level of CSR were likely to have a low level of information asymmetry and minimize the cost of equity. Therefore, high CSR participation in avoiding over-investment or under-investment increases investment returns. Recently, Liu & Tian [43] also figured out that companies must obligate corporate social responsibility leads to improving monitoring of firms in China, especially businesses facing agency problems, thus reducing over-investment in China.

Fourthly, many academic studies demonstrated that investment behaviors are affected the ownership structure. For example, in the comparison of the difference between SOEs and non-SOEs on investment efficiency, [15] documented that the level of investment sensitivity of non-SOEs is higher than SOEs. Furthermore, non-SOEs are likely to invest more efficiently than SOEs. Their findings support the agency theory that agency conflicts between managers, owners, and outside investors as well as information asymmetries prevent companies from making optimal investment decisions. Consistent with this line of discussion, [16] also figured out that state firms have a lower investment performance compared to foreign firms.

3. Research Methodology

3.1. Co-citation Method

This study was conducted by applying co-citation analysis, a bibliometric approach. According to White [59], co-citation analysis is a kind of bibliometric analysis that is used to analyze the structure of academic research topics. Co-citation analysis has been considered a useful technique in the bibliometric study. Co-citation analysis presents the frequency that two papers are cited together by a citing sample research and thereby categorizing their relationship [8, 54]. Two papers are included in the same document, they are considered to be co-cited. Co-citation analysis may help categorize the most research areas, describe the intellectual structure of a research field, and find the most active research topics by identifying networks of interconnections [66]. Figure 1 presents the steps proceeded in this study.

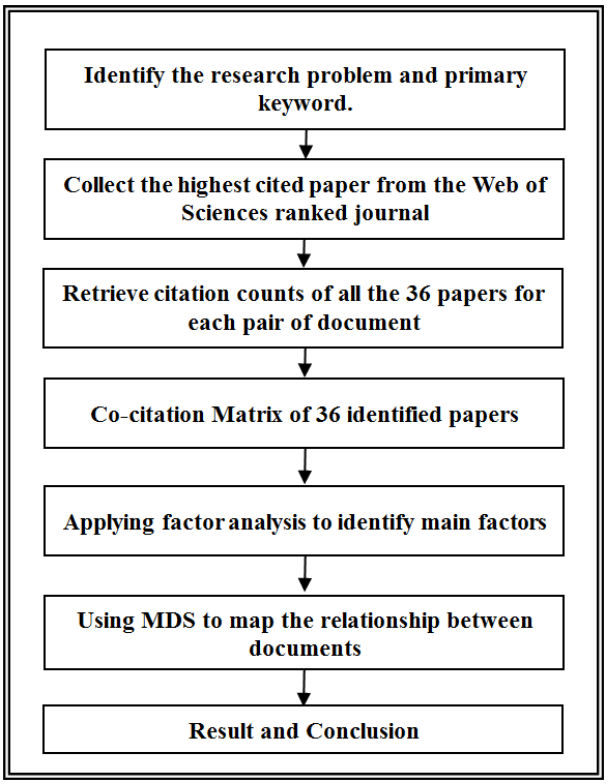

Figure 1. Summarizes the steps of this study

3.2. Data Collection

The data in this study were collected from the Web of Science. We only focus on collecting the papers that concern "Investment efficiency" which is the main keyword in the accounting and finance field. According to [2] and [20], in order to collect reliable data and significant influence on the outcome, selected papers should be cited from other studies more than 30 times. Table 1 shows the papers with the highest cited times from 1999 to 2021. A total of 36 papers cited at least 30 citations since their articles were published. The "Appendix A" presents keywords of key sample articles.

Table 1. Summary of the document resource

No.	AUTHOR	JOURNAL	CITATION
1	Biddle et al., 2009	Journal of Accounting and Economics	2519
2	Dhaliwal et al., 2012	The Accounting Review	1415
3	Chen et al., 2006	Journal of Corporate Finance	1090
4	McNichols & Stubben, 2008	The Accounting Review	975
5	F. Chen et al., 2011	The Accounting Review	966
6	S. Chen et al., 2011	Journal of Corporate Finance	876
7	Krishnan & Parsons, 2008	Journal of Business Ethics	582
8	H. Liang & Renneboog, 2017	The Journal of Finance	554
9	Terjesen et al., 2015	Journal of Business Ethics	534
10	Levi et al., 2014	Journal of Corporate Finance	517
11	Cumming et al., 2015	Academy of Management Journal	468
12	Cutillas Gomariz, 2014	Journal of Banking and Finance	359
13	Arun, Almahrog, & Aribi, 2015	International Review of Financial Analysis	305
14	Richardson et al., 2013	Journal of Accounting and Public Policy	266
15	Benlemlih & Bitar, 2018	Journal of Business Ethics	261
16	R. Chen, El, et al., 2017	Journal of Corporate Finance	241
17	Erhemjamts et al., 2013	Journal of Business Ethics	238
18	Roychowdhury et al., 2019	Journal of Accounting and Economics	230
19	Gavious et al., 2012	Pacific Accounting Review	211
20	Chan & Milne, 1999	Accounting and Business Research	178
21	Andres, 2011	Applied Financial Economics	169
22	Adam & Shavit, 2008	Journal of Business Ethics	133
23	Eisdorfer et al., 2013	Journal of Banking and Finance	121
24	R Lanis et al., 2017	Journal of Business Ethics	113
25	S. Chen et al., 2016	Journal of Business Ethics	101
26	Richardson et al., 2016	Accounting Research Journal	90
27	Cook et al., 2019	Journal of Business Finance & Accounting	89
28	Ye et al., 2019	Journal of Corporate Finance	82
29	Griffin et al., 2021	Journal of Financial and Quantitative Analysis	56
30	Elaoud & Jarboui, 2017	Research in International Business and Finance	51
31	He & Kyaw, 2018	Research in International Business and Finance	46
32	Al-Dmour et al., 2018	Journal of Accounting and Economics	45
33	Shen et al., 2015	Journal of Empirical Finance	41
34	N. Chen et al., 2017	Pacific Accounting Review	40
35	Brown-Liburd et al., 2018	Journal of Business Ethics	35
36	Liu & Tian, 2021	Accounting & Finance	32

3.3. Analysis

After the sample was selected, we built a co-citation matrix was created, and after that, multi-dimensional scale analysis was implemented.

3.3.1. Building the Document Co-citation Matrix

We need to select the most influential articles based on the frequency of citations that can be included in the analysis. In this study, we considered only documents with 30 or more citations. With 36 those documents, we created a 36 ×36 cell square symmetrical matrix, in which each cell represents the number of times each document was cited. The data in the main cross of the matrix is zero because the same study cannot be cited twice in one document. We then divided the three largest co-citations for each document by two, as recommended by White & Friffith [60]. This creates diagonal lines that estimate the next highest score in the distribution, identifying a document's relative value in a research domain. After that, using the Jaccard index [55], the matrix's raw co-citation frequency data was standardized, which provides a ratio of similarity between documents.

3.3.2. Multidimensional Scaling (MDS)

In author co-citation, multidimensional scaling (MDS) is a data compression technique that utilizes a map to illustrate similarities and differences between author groups [61]. In specially, by specifying the dimensions that reveal the differences or similarities among the variables, multidimensional scaling was used to create a connection between the authors. However, the result of MDS is hard to identify clear boundaries for each academic group, so factor analysis still needs to be conducted.

According to [45], papers in a specialized research field formed and referenced ideas based on prior literature in the same field. In other words, they cited studies in a similar field that might have similar findings or frameworks. Alternatively, [47] stated that "A self-organized system of scholars who likely to investigate the same topics, participate in the same conferences, and referencing each other's works, and publish in the same journals.". Hence, the papers belong to the same component after applying factor analysis following similar theories or research fields [48]. Factor analysis was used in co-citation analysis to decrease the amount of data created by factor loadings from the article's topic. In order to be consistent, only higher than 0.5 factor loadings were included in the same factor to comply with the co-citation analysis criterion [36].

4. Results

In this study, a 36 x 36 unit co-citation matrix was built by using a total number of co-citations collected to get the aim of identifying research trends relating to investment efficiency. Following the co-citation matrix's final result was used as input data for factor analysis and multidimensional scaling, we found four research trends, including financial reporting quality (FRQ), board gender diversity, CSR, and ownership structure.

4.1. Result of Factor Analysis

The outcome of the factor analysis is shown in Table 2. Four components have a combined explanation of more than 60%. As a result, we can confirm that the data meets the requirements. Following purified items, we suppose that the measurement of all components is reliable and appropriate for our study.

Factor 1 consists of seven items that represent the author's group that focuses on financial reporting quality (FRQ). All items have factor loading greater than 0.7, except for one factor with the lowest factor loading of 0.654, and the highest factor loading of 0.943, indicating these items had a high relation to investment efficiency. From the perspective of agency theory, both over-investment and under-investment are a revealing of asymmetric information among stakeholders. Through information concerns like moral hazard and adverse selection, [4, 42] proposed a framework for the impact of asymmetric knowledge on investment performance. In terms of moral hazard, the owner-manager conflict of interests may lead to managers seeking to maximize their own self-interest by making investment decisions that are not necessarily in the shareholders' best interests. Likewise, [22] concluded that firms with high-quality financial statements show a high return on investment due to lower cash flow sensitivity. Their results suggest that Organizations with a high level of financial reporting quality are less influenced by macroeconomic shocks than those with lower financial reporting quality. Thus, in order to increase investment efficiency, firms need to reduce information asymmetries by improving financial reporting quality.

Factor 2 includes twelve items that have factor loading greater than 0.6, and the highest factor loading of 0.873, revealing the relationship between board gender diversity and investment efficiency. Under corporate settings, [6] proposed that females well obtain voluntary information, thus reducing information asymmetry between managers and female directors. Prior scholars proved that gender-diverse boards might enhance the quality of financial reporting [30, 37, 56]. They concluded that the greater the level of females on board, the lower the level of earnings manipulation. [50, 60] further found a negative relationship between gender diversity and information asymmetry. These findings are indicative of the positive link between gender diversity and the level of investment performance. Further, females are likely to be more ethical in management so they are less likely to conduct unethical actions to gain some private benefits such as accounting misreporting [21], and tax avoidance [39]. These results further reinforce the belief that board gender diversity will help improve investment efficiency in businesses.

Table 2. Result of Factor Analysis

No.	Authors	Component			
		Factor 1	Factor 2	Factor 3	Factor 4
1	Biddle et al., 2009	0.943			
2	McNichols & Stubben, 2008	0.897			
3	F. Chen et al., 2011	0.892			
4	Cutillas Gomariz2014	0.811			
5	Roychowdhury et al., 2019	0.738			
6	Elaoud & Jarboui, 2017	0.733			
7	Al-Dmour et al., 2018	0.654			
8	Krishnan & Parsons, 2008		0.873		
9	Terjesen et al., 2015		0.865		
10	Levi et al., 2014		0.834		
11	Cumming et al., 2015		0.829		
12	Arun, Almahrog, & Aribi, 2015		0.798		
13	Richardson et al., 2013		0.786		
14	Gavious et al., 2012		0.735		
15	R Lanis et al., 2017		0.691		
16	S. Chen et al., 2016		0.688		
17	Richardson et al., 2016		0.682		
18	Ye et al., 2019		0.672		
19	Griffin et al., 2021		0.669		
20	Dhaliwal et al., 2012			0.889	
21	H. Liang & Renneboog, 2017			0.864	
22	Benlemlih & Bitar, 2018			0.775	
23	Erhemjamts et al., 2013			0.742	
24	Chan & Milne, 1999			0.721	
25	Adam & Shavit, 2008			0.706	
26	Cook et al., 2019			0.674	
27	Brown-Liburd et al., 2018			0.635	
28	Liu & Tian, 2021			0.632	
29	S. Chen et al., 2011				0.885
30	R. Chen, El, et al., 2017				0.763
31	R. Chen, El, et al., 2017				0.763
32	Andres, 2011				0.718
33	Eisdorfer et al., 2013				0.702
34	He & Kyaw, 2018				0.658
35	Shen et al., 2015				0.647
36	N. Chen et al., 2017				0.643
	Variance explained	84.96	76.18	79.49	74.29

Total variance explained: 80.687%

Factor 3 consists of nine items that have factor loading greater than 0.6, and the highest factor loading of 0.889 which indicates the link between CSR and investment efficiency. Martin and Moser [44], investors are motivated by positive relationships between organizations and communities. Chan & Milne [12] concluded that investors are more likely to join investment allocations with leading environmental performance instead of poor environmental performance. The mechanism of CSR may help firms improve competitive advantages, reputation, credibility, and market segment. Similarly, corporate social responsibility has a positive association with return on investment, assets, and revenue growth. On the one hand, CSR may support organizations reduce production costs by using safe and cost-effective manufacturing methods. [3, 11]. In addition, many scholars [23, 41] suggested that high CSR companies are disclosed to be linked to fewer agency conflicts and less information asymmetry. Therefore, it is not surprising to see increasingly significant numbers of studies [9, 19] provided evidence indicating that the company's commitment to its stakeholders relating to CSR disclosure level has a strong influence on their making an investment decision. Firms with higher CSR invest more efficiently and consequently lower both overinvestment and underinvestment.

Factor 4 includes eight items with factor loading greater than 0.6 that focus on the majority of studies that explore the role of ownership structure on investment efficiency. Previous studies demonstrated that different types of owners have divergent preferences regarding various investment behavior. For example, N. Chen et al., [15] documented that when ownership concentration is lower, investment efficiency is higher, especially for SOEs. They find strong and robust evidence that state and foreign institutional owners are linked to the levels of information asymmetry along with agency conflicts. Managers tend to pursue self-interests at the expense of outside shareholders [25, 53]. Following agency theory, the association between ownership structure and investment performance, it's realized that a low level of insider ownership might help control managerial entrenchment, large stockholders in order to increase direct monitoring, and a large amount of foreign ownership that can help to the degree of agency problems and diminish information asymmetries [18].

Based on all criteria, all components accumulate a total explained variance of more than 70% so we can conclude the reliability and internal consistency of these four factors in the series of prior literature.

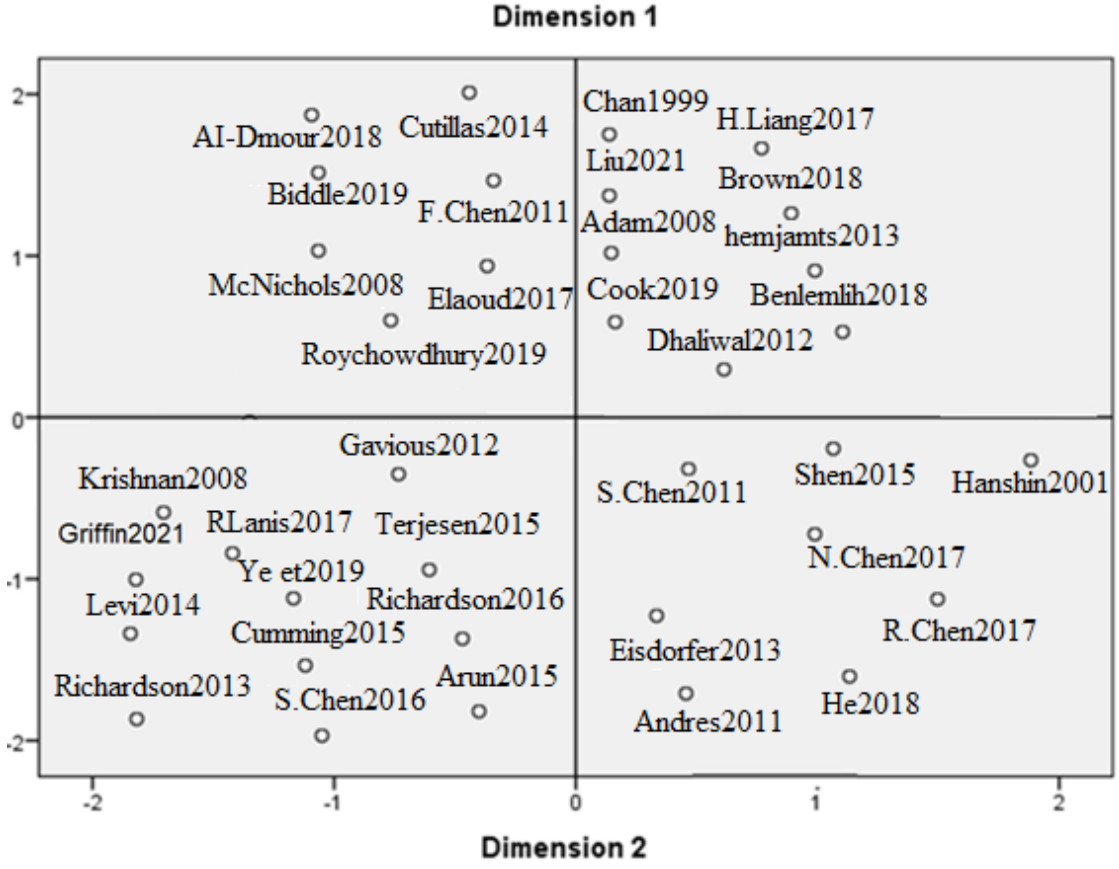

Figure 2. Derived Stimulus Configuration Distance Model

4.3. Result of Multidimensional Scaling (MDS)

Fig. 2 reports the result of Multidimensional Scaling (MDS). It was described by a map of the structure of investment efficiency as two-dimensional scales. There are four research trends related to investment efficiency in academic foundation networks. The documents belonging to the same group have the same research problem. Thus, there are interconnection and considerable commonalities between them [48].

The stress value is 0.324, higher than an acceptable value of 0.2 and R2 is 0.6981 for two dimensions, implying an excellent match for the data [45]. Based on the result, two large groups appeared from left to right on the horizontal axis. Group 1 contains the most papers from factor 1 and factor 3, while group 2 contains all papers from factors 2 and factor 4. The factor loading values for factors 1 and 3 are the highest. Consequently, the majority of studies in the field of investment efficiency research focus on the influence of Financial Reporting Quality and CSR as well as board gender diversity and ownership structure is the rest.

5. Discussion and Conclusion

The results of this paper provide an overview of factors that influence investment efficiency. There are four research trends were found: financial reporting quality, board gender diversity, CSR, and ownership structure.

Firstly, based on collected studies, an increasing amount of articles have been published that focus on the link between financial reporting quality and investment behavior and investment efficiency. FRQ plays a significant role in reducing information asymmetries and enhances investment efficiency. The quality of financial statements greatly affects the strategic decisions of managers, policymakers, and especially investors. Therefore, firms need to provide a lot of useful information for stakeholders, including financial information as well as non-financial information. Moreover, businesses also need to provide short-term and long-term strategies for shareholders and investors. This not only increases predictability for businesses but also indirectly makes it easier to attract investment. A transparent, comparable financial statement will easily attract investment capital, especially foreign direct investment. It is extremely important for developing countries in the process of integrating into the globalized economy. Indeed, this study has a strong contribution to policy-makers in emerging nations in enhancing the accountability and transparency of firms' reporting to investors. Accordingly, it could also assist investors in monitoring the investment activities of managers and increase the level of investor protection.

Secondly, an emerging strand of research involves gender diversity on board. The authors discovered that decision-making is mostly influenced by gender and the gender of board members plays an important role in board effectiveness. The need to diversify the board of directors is becoming increasingly apparent. Female board members are found to have a positive impact on the board's ability to monitor, generate different perspectives and skills, and introduce different leadership styles. Documents provided that board gender diversity creates value and contributes firms to having a competitive advantage, linking with high financial performance along with investment efficiency. These findings allow us to offer recommendations regarding the presence of women on firms' boards. Companies should add qualified women to their boards to balance the male-female ratio because women have the potential to create symbolic value both inside and beyond the organization, connecting it to other sectors.

Thirdly, the positive relationship between CSR and investment efficiency has been revealed in lots of previous literature. Mr. Florian Beranek, technical advisor of Project Unido (United Nations Industrial Development Organization) stated that "Make sure responsibility for the environment, humans and society is the core of sustainable development that any business must do". CSR plays an increasingly important role in improving the competitiveness of firms, helping to create value for enterprises and promote the trust and respect of consumers, partners, investors, and society. By implementing CSR, firms not only contribute benefits to society but also have more opportunities to promote and build their own brands. We realize that CSR really brings many advantages to businesses, such as: improving brand image, enhancing customer loyalty because customers are likely to prioritize using products and services of companies with a better social reputation; saving operating costs by optimizing operating processes; especially, enterprises implementing CSR will have many chances to access investment capital easily because investors are often willing to support businesses that have comprehensive CSR policies. For the above reasons, our suggestion, policymakers need to consider CSR as a long-term strategy. Accordingly, the government should have more efforts to create favorable conditions for increasing awareness of CSR, therefore promoting the implementation of CSR and creating new opportunities for all businesses.

Next, other research trend includes studies that investigated different forms of ownership that affect investment performance. There have been many prior studies that found that foreign institutional owners could be concerned with more investment efficiency than state institutional owners. I supposed that emerging markets, which enjoy capital inflows primarily, come from abroad. In order to do that, governments of developing countries must expand economic cooperation with others around the world by creating favorable conditions and flexible preferential policies to encourage foreign investors to participate in projects along with attracting foreign direct inflows for promoting economic growth. However, they should implement many solutions to strengthen strict control and appraisal of foreign investment projects, especially mergers and acquisitions. Additionally, the government also needs to come up with solutions to support domestic enterprises to improve their competitiveness to catch up with global

economic development.

In general, the findings also have relevant implications not only for researchers but also for policy-makers, managers, creditors and investors in ways that help them understand the factors that might be a consequence of investment decisions. We propose that the role of the government is very important in supporting domestic firms and attracting foreign direct inflows (FDI) to participate in investment projects. The government needs to generate more advantages for firms by improving commercial disciplines as well as tax regulations. At the same time, they should better invest in infrastructures to bring more chances for attracting investors. Given that results also highlighted that policymakers need to balance the interests of managers and shareholders to promote investment efficiency.

Besides these four subjects from the co-citation analysis, we suggested other possible future research topics facilitating access to external financing or financial constraints influence on investment efficiency. In fact, the sources of external financing (including bank loans and funding from credit institutions) could be assumed as an important factor to get access to a successful investment. This source of capital may help firms ensure their solvency in both the short term and long term. However, in reality, most businesses are facing a huge challenge in accessing sources of finance due to several reasons, such as agency problems, information asymmetry, tax regulations, and internal managemental constraints,...Currently, there are still very few scholars interested in studying the financial factors affecting investment performance, therefore, we believe that it could be a quite interesting future research trend because financing is also extremely important to get a successful investment.

Appendix A. Summary of keywords of key sample articles

No.	AUTHOR	MAIN KEYWORDS
1	Biddle et al., 2009	Financial reporting quality, capital investment
2	Dhaliwal et al., 2012	Corporate social responsibility, analyst forecasts, nonfinancial disclosure
3	Chen et al., 2006	Ownership, corporate governance, fraud, China's enforcement actions
4	McNichols & Stubben, 2008	Earnings management, investment
5	F. Chen et al., 2011	Investment efficiency, under- and overinvestment, financial reporting quality, private firms, emerging markets, financing sources, tax incentives
6	S. Chen et al., 2011	Government intervention, political connections, investment efficiency
7	Krishnan & Parsons, 2008	Earnings quality, gender diversity, ethics, conservatism
8	H. Liang & Renneboog, 2017	Corporate social responsibility, legal origins, stakeholder orientation
9	Terjesen et al., 2015	Corporate governance, gender equality, board gender codes, board gender quotas, welfare state, left-leaning political coalitions, path dependency, publicly traded firms, state-owned enterprise
10	Levi et al., 2014	Director gender, bid initiation, bid premium, mergers and acquisitions, overconfidence, risk aversion
11	Cumming et al., 2015	Corporate governance, ethical sensitivity, fraud, gender diversity, risk aversion
12	Cutillas Gomariz, 2014	Investment efficiency, overinvestment, underinvestment, financial reporting quality, debt maturity
13	Arun, Almahrog, & Aribi, 2015	Earnings management, gender diversity of boards, financial reporting
14	Richardson et al., 2013	Board of director, corporate tax aggressiveness
15	Benlemlih & Bitar, 2018	Corporate social responsibility, corporate governance, investment efficiency, stakeholders theory
16	R. Chen, El, et al., 2017	Privatization, investment efficiency, corporate governance
17	Erhemjamts et al., 2013	Corporate social responsibility, firm performance, investment policy, organizational strategy
18	Roychowdhury et al., 2019	Financial reporting, corporate investment
19	Gavious et al., 2012	Earnings management, earnings quality, Gender, women's motivation, boards of directors, corporate governance
20	Chan & Milne, 1999	Firms' environmental performance, investment funds

Table Continued

21	Andres, 2011	Family firms, ownership structure, investment policy, corporate governance
22	Adam & Shavit, 2008	Corporate social responsibility, social responsible investment, ethical investment, corporate social performance, financial performance, theory of SRI
23	Eisdorfer et al., 2013	Capital structure, executive compensation, agency costs, investment
24	R Lanis et al., 2017	Board of director diversity, corporate governance, tax aggressiveness
25	S. Chen et al., 2016	Female director, diversity, R&D, risk management
26	Richardson et al., 2016	Corporate governance, board of directors, gender, corporate tax aggressiveness
27	Cook et al., 2019	Corporate social responsibility, investment efficiency, innovation
28	Ye et al., 2019	Corporate governance, agency problem, board gender diversity, dividend payout, female board directors
29	Griffin et al., 2021	Board gender diversity, corporate innovation
30	Elaoud & Jarboui, 2017	Auditor specialization, accounting information quality, investment efficiency
31	He & Kyaw, 2018	Overinvestment, ownership structure, corporate governance
32	Al-Dmour et al., 2018	Quality of financial reporting, non-financial business performance, shareholdings companies
33	Shen et al., 2015	Earnings management, investment efficiency
34	N. Chen et al., 2017	Corporate governance, incentive-based compensation, institutional investor, investment efficiency, ownership structure
35	Brown-Liburd et al., 2018	Corporate social responsibility, fairness perceptions, investment decisions
36	Liu & Tian, 2021	Mandatory corporate social responsibility disclosure, investment efficiency

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