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The Impact of Risk Disclosure on Investment Efficiency: Evidence From Egypt

Abstract

This study aims to investigate the impact of risk disclosure on investment efficiency. The study tests hypotheses using a sample of 84 Egyptian companies registered on Stock Exchange for the period (2014-2018). The researcher uses content analysis to calculate a risk disclosure index (RDI) from annual reports and study how it impacts the efficiency of investment in companies. The results show that there is a negative and significant relation between risk disclosure and investment, meaning that in light of the increase (decrease) in risk disclosure, companies have less (more) investment efficiency. This result is consistent with the divergence hypothesis, which indicates that when discloses details about risk information, investors can realize that the company is facing risks, so they demand more compensation to avoid uncertain risks, or at least withdrawn their equity ownership. This affects the inefficiency of investment. The study divided the sample into two groups: overinvestment and underinvestment, to test the impact of annual risk disclosure on investment. The results show a significant and negative relation between the overinvestment group and risk disclosure, while it is insignificant in the under investment group and risk disclosure whereas it indicates that risk disclosure can enhance the efficiency of investment mainly by limiting ineffective investment conduct. These results supported the literature on both risk disclosure and investment efficiency.

Keywords: Overinvestment –Underinvestment-Risk disclosure- Investment Efficiency.

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أثر الإفصاح عن المخاطر على كفاءة الإستثمار: دليل من مصر

ملخص البحث

يهدف البحث إلى دراسة أثر الافصاح عن المخاطر على كفاءة الاستثمار. وقد إجريت الدراسة على عينة مكونة من ٨٤ شركة مصرية مقيدة بالبورصة في الفترة من (٢٠١٤-٢٠١٨). تم استخدام تحليل المحتوى لحساب مؤشر الافصاح عن المخاطر (RDI) من التقارير السنوية ودراسة كيفية تأثيره على كفاءة الاستثمار في الشركات. وقد أشارت نتائج الدراسة الى وجود علاقة سلبية وذات دلالة إحصائية بين الإفصاح عن المخاطر وكفاءة الاستثمار، مما يعني أنه في ظل زيادة (نقص) الإفصاح عن المخاطر ، فإن كفاءة الاستثمار فى الشركات تقل (تزيد). تتفق هذه النتيجة مع فرضية الاختلاف. فالافصاح عن معلومات المخاطر يمكن المستثمرين من ادراك ان الشركة قد تواجه مخاطر لذلك يطالبون بمزيد من التعويضات لتجنب تلك المخاطر غير المؤكدة، أو الغاء ملكية الاسهم الخاصة بهم، وهذا قد يؤثر على كفاءة الاستثمار. كما قسمت الدراسة العينة إلى مجموعتين: فرط الاستثمار، نقص الاستثمار،لاختبار أثر الإفصاح عن المخاطر على سلوك الاستثمار. وقد أشارت النتائج إلى وجود علاقة سلبية وذات دلالة إحصائية بين مجموعة الإفراط في الاستثمار والإفصاح عن المخاطر ،وعلاقة سلبية وغير معنوية بين مجموعة النقص فى الاستثمار والافصاح عن المخاطر. تشير هذه النتيجة الى أن الإفصاح عن المخاطر يمكن أن يحسن كفاءة الاستثمار بشكل رئيسي عن طريق الحد من سلوك الاستثمار المفرط.

الكلمات المفتاحية: الافراط فى الإستثمار- نقص الإستثمار- مخاطر الافصاح – كفاءة الإستثمار.

1. Introduction

Due to the changes in the business environment, the most important of which are the complexity of the company's operations, financing structures, and the intensification of competition, which lead to a review of the current financial reports, as there is a lack of transparency and clarity in disclosure of risks.

The accounting literature (Neifar and Jarboui, 2018 & Mokhtar and Mellett, 2013) indicated insufficient risk disclosure practices and the existence of a so-called "risk information" gap between financial statement preparers and users, which was expressed in a study by (Khlif and Hussainey, 2016,p.2) by saying "Companies are providing insufficient risk information in their annual report".

The importance of accounting disclosure on risks appears in enhancing the efficiency of the money market, as it helps investors to estimate the size and timing of the company's future cash flows and their ability to continue and predict stock returns, which is reflected in the efficiency of investment decisions (Al-Hadi et al., 2016).

On the other hand, it helps companies to improve financial flexibility, thus reduces investors' demand for additional information by reducing information asymmetry and agency costs, which reduces the retention of cash, and other cash that is kept for hedging purposes (Nahar et al., 2016(a)). It also helps in improving practices of risk management strategies, and emphasizing the managers' effectiveness in dealing with them, hence, enhancing the company's chances of reaching investments.

Despite the importance of risk disclosure as a way to increase the transparency of information in financial reports and increase confidence in the financial position of the company, it doesn't receive sufficient attention, as there is not yet an accounting standard that regulates the various aspects of the company's risk disclosure and setting the minimum level for disclosure of financial and non-financial risks, which may be reflected in the variation and low level of risk disclosure in the financial reports and affect the efficiency of investments in the company.

The mandatory disclosure of risks in its current condition has become insufficient to meet the needs of users of financial reports due to its neglect of many financial and non-financial items and the increasing needs of stakeholders for information.

The studies of (Cordazzo et al., 2017 & Moumen et al., 2015) indicated ineffectiveness in reducing the information gap between companies and investors, so there was increased pressure on companies to voluntarily disclosure more of risk information. This is supported by the Stakeholder Theory that companies must obtain the satisfaction of stakeholders in order to have a competitive advantage in the market and remain in business (Al-Hadi et al., 2016).

The accounting studies (Neifar and Jarboui, 2018 & Al-Maghzom et al., 2016) have provided practical evidence on the importance of risk disclosure as it contributes from the perspective of agency theory to solve the problems of adverse selection and moral hazards that arise within the framework of the relationship between managers and owners by limiting conflicts of interest (Nahar et al., 2016 (b)). It also serves as an indicator to the funding agencies about the management's ability to deal with potential risks.

In addition to that, the quality of risk disclosure may contribute to enhance risk management as well as improving transparency, oversight, investor protection and reporting quality, which may be reflected in the efficiency of investment (Elzhar and Hussainy, 2012). Many accounting studies have examined the relationship between the level of disclosure and investment efficiency in companies. Most of their results were mixed.

The study of (Elberry and Hussainey, 2020) concluded that an increase in the level of disclosure related to the company's performance may result in a higher level of investment in the company; the results also indicated a bidirectional relation between the level of risk disclosure and the efficiency of investment in companies.

The study of (Hung et al., 2010) also found that increasing the level of disclosure may help investors to feel more confident regarding their decisions. The study also indicated that the different forms of disclosure may not result in significant differences in the results of investments, as the results of (Li et al., 2019) indicated that the higher the level of risk disclosure, the more of the investment efficiency in companies.

The key difference between the current study and the above literature is this study is concerned with studying the impact of risk disclosure on investment efficiency in Egyptian companies as an emerging market. The study will be based on the method of content analysis of risk disclosure in the annual reports.

Based on that, the research problem can be formulated in the following questions.

1. What is the impact of risk disclosure on investment efficiency?
2. What is the impact of risk disclosure on overinvestment ?
3. What is the impact of risk disclosure on underinvestmen?

Research objective

This research aims to study:

1. The impact of risk disclosure on investment efficiency in Egyptian companies.
2. The impact of risk disclosure on overinvestment in Egyptian companies.
3. The impact of risk disclosure on underinvestment in Egyptian companies.

Research Contribution

This research contributes in three ways to the literature.

1. This paper helps to fill the gap in the literature of the impact of risk disclosure on investment in Egyptian companies as an emerging market.
2. The assessing of the level of risk disclosure in the annual reports of companies registered on the Egyptian stock market provides practical evidence of the need to improve its quality, especially in the light of the

multiplicity of different risks facing companies and affecting the efficiency of their investment.

3. It contributes in restoring investor confidence in the annual reports of Egyptian companies, especially that many studies have concluded that the Egyptian market lacks adequate disclosure of risks (Marzouk, 2016 & Mokhter and Mellete, 2013), and thus their disclosure reduces the information asymmetry. It finally leads to efficient investment decisions.

This research is organized as follows. In Section 2, describe risk disclosure and theories explaining it. In Section3, describe investment efficiency. Section 4 presents a literature review on information, risks and their effect on companies' investment. In Section 5, the researcher developed hypotheses. Section 6 describes the methodology of research. The results of research are discussed in Section 7, and Section 8 presents the conclusion of the study.

2. Risk disclosure: overview

The concepts of risk have varied and were linked to different interpretations by those interested in them. The study of (Wahh et al., 2020) indicated that risks are the possibility of having reduction in profits or achieving losses in the future.

The study of (Dobler et al., 2011) indicated that risks are the occurrence of natural events, defined as any event or act that negatively affects the facility's ability to achieve its goals and leads to unpleasant results.

The study of (Alswaidan, 2017) indicated that risks are the possibility of achieving potential losses or profits resulting from the circumstances in which the company operates, as defined by the International Federation of Accountants (IFAC, 1999) being the uncertainty related to future events and how they affects the achievement of the company's strategic, operational and financial objectives.

The accounting literature has presented many theories that explain the motives of companies to disclose risks in their annual reports (Khlif and Hussainey, 2016).

2.1 The Economic Theory Approach

This approach relies on self-interest and profit maximization (Taylor et al., 2010). This approach uses agency theory in explaining risk disclosure, which believes that companies tend to disclose risks in order to reduce conflicts between management and shareholders and reduce the degree of uncertainty related to the company's performance (Buckby et al., 2015).

Also, the Signaling Theory indicated that management discloses risks in order to send signals to the market about the ability of the company to deal with these risks to protect investors, which may represent an incentive for other companies to voluntarily disclose more risks (Abduall et al., 2015).

2.2 Social and Political Theory Approach

This approach is based on explaining the motives for accounting disclosure about risks on the Legitimacy Theory which states that companies tend to disclose risks to obtain support and endorsement of shareholders to legitimize many procedures and avoid litigation and the costs of reputation (Salem et al., 2019), as legalizing Companies enable them to demonstrate their ability to manage and overcome risks, which may enhance investor confidence (Oliveria et al., 2011).

Whereas the Stakeholder Theory considers that the company's management has ethical obligations towards stakeholders, so it must disclose to them information related to risks in order to help them in making decisions, preserving their wealth and increasing trust between the company and its stakeholders (Habbash et al., 2016). Positive theory and political theory have also shown that companies may tend to disclose risk in order to avoid more political considerations and reduce oversight costs as well as to avoid damage to the company's reputation (Salem et al., 2019).

2.3 Corporate Risk Disclosure and Emerging Economies.

Due to the rapid economic growth of emerging markets in recent years, these markets have become the focus of investor attention to stimulate economic growth and attract foreign investment. Many emerging markets have provided various promising investment incentives through regulatory reforms and monetary policies to serve the interests of the investor (Millar et al., 2005).

However, unlike their western counterparts, stock market regulations in emerging countries tend to be less complex and suffer from less investor protection practices, such as seizing minority shareholders through controlling stakeholders (Gonenc and Aybar, 2006). The perception that shareholders in emerging markets incur additional risks due to relatively lax corporate governance standards could hamper the flow of capital (Gibson, 2003 & Klapper and Love, 2004).

In most emerging economies, it is not uncommon for large shareholders to dominate a large number of companies, who are able to exercise their rights of control, and thus expose minority shareholders to high risk (Lang et al., 1999). A small group of investors leads to problems associated with the concentration of ownership, which increases the risk of seizing minority rights (Claessenens et al., 2000) and increasing information asymmetry between managers and investors (Chau and Gray, 2010 & Healy and Palepu, 2001).

In addition, the study of (Siregar & Siagian, 2013) indicated that there is a deficiency in the quality of risk reporting in emerging markets compared to those in advanced market economies. Together, these two factors (i.e. the lack of protection for minority interests and insufficient disclosure about risk) create an unfavorable investment climate and thus potentially prevent foreign direct investment from flowing into emerging economies. For example, (Mitton, 2002) assumes that these elements (i.e. protecting and promoting minority interests and risk disclosure) are two basic pillars of ensuring good corporate governance.

As for risk disclosure practices in the Egyptian environment, they are weak, lack clarity, difficult to estimate, and focus on historical information. In addition to their focus on the quantity of disclosure rather than its quality, due to political and economic turmoil, Egyptian standards have focused more on financial risks.

As indicated in Standard No. (7) for events following the balance sheet date, it is necessary to disclose the risks that affect future results. Standard No. (13) requires disclosure of the risks of exchange rate instability. While Standard No. (25) indicates that financial instruments explain, recognition and measurement of risk related to financial derivatives.

3. Investment efficiency

Corporate investment is one of the most important decisions and essential activities needed to ensure corporate growth and its continuation in the long term. However, the separation between ownership and management allow managers to make decisions that are not in the company's and shareholders' best interests. One of these decisions is investment which the company carried out during the year.

Managers may prefer to invest the surplus cash in unprofitable projects to maximize their welfare. In addition to financial benefit. This may be reflected in the efficiency of those decisions, or what is known as the efficiency of investment decisions.

Investment efficiently refers to projects with positive net present value (NPV) in the absence of market frictions such as adverse selection or agency costs.

Inefficient investment decisions mean that the investment decision may result in a situation of over-investment, when the management chooses investment projects with a negative net present value. or a case of under investment when the management does not choose the investment projects with a positive net present value.

Financial reporting quality may be related with investment efficiency in two ways.

First, it is argued that financial reporting reduces the cost of adverse by lowering the information asymmetry between the company and investors, as well as investors. That an obligation to more disclosure (more transparency) decreases information asymmetry and improves company liquidity. On the other hand, the presence of information asymmetry may cause capital suppliers to decrease the stock price and raise the cost of capital. As a result, if financial reporting quality decreases adverse selection costs. It can enhance investment efficiency by lowering external funding costs.

Second, financial reporting plays an important role in eliminating agency problems. For example, accounting information is often used as an important input into compensation contracts. It also considers an important source of information that shareholders use to track directors.

In addition, accounting information contributes to the tracking of stock markets as a source of firms' information.

As a result, if financial reporting quality decreases agency problems it may then improve investment efficiency through increasing shareholder ability to track managers, thereby allowing for better project selection and lower funding costs.

4. Literature Review

In this section, previous studies are classified into studies on the relationship between information risk and corporate investment, and studies on risk information disclosure.

4.1 Literature on information, risks and corporate investment

In general, information is the determining factor of investment efficiency as the level of ineffective investment increases with the increase of the level in information asymmetry (Bushman and Smith, 2001). While increasing the accuracy of accounting information would improve expenditure efficacy of investment through strengthening contracts and oversight, and also reducing agency problems. (moral hazard and adverse selection). (Healy and Palepu, 2001)

One of the leading studies in the field of linking the efficiency of investment decisions and accounting information is the study of (Biddle et al., 2009) which aimed to study the effect of financial reporting quality on the inefficiency of investment decisions, specifically examining whether the increase in the quality of financial reporting is in the interest of reducing the lack of investment or excessive investment.

The study was conducted using 34,791 observations` of US companies listed on the stock exchange for the period (1993-2005). The study concluded that higher quality of financial reporting is related to low levels of investment. Companies with high quality financial reports invest less when the total investment is high or the macroeconomic suffers from excessive investment and invests more when the total level of investment is low.

These results are consistent with the argument that the quality of financial reporting is supported by investing in companies .Where companies with good financial reporting are less likely to deviate from the expected level of investment which is specified based on the expected growth opportunities for companies.

Generally, these results are consistent with the notion that quality financial reporting plays a role in reducing information friction represented by moral hazard and adverse selection, which impede the efficiency of investment.

The study of (Li and Wang, 2014) also examines the validity results of (Biddle et al., 2009) which were conducted using 2319 observations of Chinese companies for the period (2004-2006).The results of the study indicated that the quality of accounting information is positively related to the high quality of financial reports, and inversely with the inefficiency of investments (overinvestment, underinvestment).

The study of (Gomariz and Ballesta ,2014) also tested the same relationship and the study was conducted on a sample of Spanish companies for the period (1998 to 2008) on 567 observations. The results concluded that the quality of accounting information for listed companies is positively related to the high quality of financial reports and inversely with the inefficiency of investments.

The study of (Chen et al., 2011) also aimed to test the same relationship, by applying to emerging markets; the study was conducted in private Firms, which are expected to decrease the quality of accounting information and financial reports. The results indicated a positive relation between the quality of accounting information, financial reports and the efficiency of investment. (Dutta and Nezlobin, 2017) shows that there is an important effect between the disclosure of information and investment efficiency especially when the accounting disclosure covers information about future capital.

On the other hand, the investment efficiency is maximized with a reasonable degree of accuracy for disclosure of future cash flow. Studies that have used signal theory in an attempt to understand disclosure practices in general and disclosure of risks in particular. Indicate that executive managers may use disclosure as if they are indicating the efficiency of their company by disclosing more information about risks.

It may also be used to indicate their competence in risk management. This may be reflected in improving the credibility of the company, liquidity of stocks, the market value of the company, and the efficiency of investment. (Al-Maghzom et al., 2016& Bitar and Benlemlih, 2018&Xinsheng et al., 2012).

The study of (Merkley,2014) also indicated that the accounting disclosure of risk information may provide stakeholders with information related to the performance and value of the company through annual financial reports, which may be reflected inefficient investment decision-making.

the study of (Chen et al., 2017(b)), which is concerned with studying the bidirectional relation between investment efficiency and transparency of disclosure, using a sample of Australian companies for the period (2008-2014). The results indicated that there is no effect of transparency of disclosure on the efficiency of investment.

This result is inconsistent with the results of the studies (Biddle et al., 2009 & Gomariz and Ballesta, 2014), which suggested that by reducing information asymmetry, financial reporting quality (FRQ) may improve investment efficiency. Moreover, (Chen et al., 2017(b)) have shown that the negative relationship between investment efficiency and disclosure shows that managers who have ineffective investments may provide more information to explain their deviations from optimal investments.

The studies of (Lai etal., 2014 & Al-Hadi et al., 2016) indicate that increasing the disclosure of market risks usually leads to improved performance of investment. The study of (Dutta and Nezlobin, 2017) also shows an important relation between risk disclosure and investment efficiency, they indicate that investment efficiency improves in the precision of disclosure, especially when disclosure presents information about the future. (Zhong and Gao, 2017) find that the nature of voluntary disclosure, which contributes to decreasing information asymmetry between managers and investors leads to investment efficiency.

Generally, the literature concludes that corporate disclosure leads to an increase in corporate investment performance.

4.2 Literature on risk information disclosure.

Another key determinant of investment efficiency is "risk". From the perspective of external financing costs, (Panousi and Papanikolaou ,12012) show that disclosure of company risks has a negative relationship with company investments when the risks associated with the company increase. This affects the ability of the company to obtain adequate external financing, which is reflected in the investment in the company.

The study of (Gulen and Ion, 2016) indicated that there is a strong negative relation between capital investment and the degree of risk to which the company is exposed.

Kravet and Muslu (2013) also explained that insufficient information disclosed about risks leads to an increase in information risks borne by interested parties in general and investors in particular. For example, insufficient disclosure on risks that the company is exposed, leads to limit the investors' ability to accurately estimate future returns and thus expose them to information risks, hence, the expansion of risk disclosure scope will lead to a reduction in the risks of information and thus reduce the overall risks that investors are exposed to. This result is consistent with study of (Campellet al.,

2014) which concluded that disclosure of risks in annual reports reduces information asymmetry and increases investor awareness of risks.

The study of (Moumen et al., 2015) also concluded that CRD increases the ability of investors to anticipate future profits in emerging financial markets. Their study was conducted on a sample of emerging markets in the Middles East and North Africa (MENA) for the period (2007-2009) with 809observations.

In addition, the study of (Bravo, 2017) found that CRD increases investor expectations, which in turn leads to a better evaluation of the company's performance. This may increase the efficiency of investments. The study was conducted on a sample of 95 companies registered on the Stander’s & Poor's Stock Exchange for the year 2009.

The study of (Al-Hadi et al., 2016) also aimed to examine the relationship between disclosure of market risks and the efficiency of investment decisions in financial companies for the period (2007-2011). The study was conducted on a sample consisting of 553 company observations in countries of the Gulf Cooperation Council The study indicated that disclosure of market risks reduces information asymmetry, as well as moral hazard. The results also indicated that there is a negative correlation between disclosure of market risks and both lack and increase in investment, and this correlation is more evident in large companies. Companies may use risk disclosure to provide an indication to stakeholders.

(Elshandidy et al., 2013) clarified that executive manager who discloses risk information can distinguish themselves from those who did not disclose this information and thus may result in improved expectations of stakeholders.

When a company is facing difficult circumstances, it is important to disclose risk information to the market as a warning and provide specific information to manage these risks. These results are consistent with the hypothesis of difference which considers that disclosure of risks enhances investors' perception of risks (Yao and Zhao, 2016). (Ntim et al., 2013) also concluded that disclosure reduces the asymmetry of information and allows access to the real value of the company by different shareholders.

These findings are in line with the convergence hypothesis in risk disclosure analysis .It is evident from the results of previous studies that some of them support the positive relationship between disclosure of risks and investment efficiency, and some support the negative relationship, and therefore, the impact of risk disclosure on investment efficiency is still under discussion.

5. Hypotheses Development

In this section of the study, the development of the study hypotheses will be discussed from two different perspectives. The first is the convergence hypothesis and the second is the divergence hypothesis:

- **Convergence Hypothesis**

The convergence hypothesis indicates that there is little heterogeneity of information risk between the company and the investors. Companies are highly transparent and investors have a low perception of risk. As the level of risk reporting is improved, information transparency increases, and efficiency of investment increases by reducing information asymmetry and the agency problems (Roulstone, 1999).

In this hypothesis, several aspects are discussed. First, the accounting disclosure about the company's risk shows that the company is investing in an acceptable range (Campbell et al., 2014). Those disclosed risks update the company’s risks and thus reveal risks that are not identified by the company and that increase the availability of information about the company. It also shows managers' confidence in risk management, which increases manager awareness of the company investment, as a result; its investment effectiveness increases.

Second, further disclosure of risk reveals management's rational stance. In the event of high environmental risks and uncertainty, managers will prefer superior projects. They are also motivated to make exemplary investment decisions that effectively reduce the agency problems between controlling shareholders and minority shareholders.

Third, risk disclosure enables investors to understand potential fluctuations in profits and, consequently, this may reduce the required risk compensation and lead to more accurate pricing. In addition, high-quality disclosure of information will reduce the cost of external capital and the need for capital surplus resulting from temporary mispricing, and help successful companies to obtain optimal capital, and increase investment efficiency (Biddle and Hilary, 2006 & Biddle et al 2009& Healy and Palepu, 2001).

- **Divergence Hypothesis**

This hypothesis indicates that there is a clear variability between the company and the investors in risk details. Those companies are poorly transparent in terms of risk details and investors have a high-risk perspective. The complexity in measuring risk information causes market participants to fear risks by raising their understanding of risks (Kravet and Mulsu, 2013).

Asymmetry of information between investors and companies results because of uncertainty in the information environment and difficulties in interpreting risk disclosure, whereas investors cannot determine the real conditions of the company (Campbll et al., 2014).

When a company discloses details about risk information, investors can realize that the company faces immense risks, so they demand more compensation to avoid unconfirmed risks, or at least cancel their equity ownership.

There will be a lack of investment due to the increased cost of capital or insufficient capital. Disclosure of risks may add to the agency's problems. Managers, who are clearer than others about actual operating conditions, may hide or disclose risk information to influence investor decisions for personal gain. This may be inappropriate for an inefficient investment. (Liang et al.,2010)

From the previous hypotheses, it is not evident whether the risk disclosure is in line with the convergence hypothesis or with divergence, hypothesis and therefore its impact on investment efficiency is still under investigation. So, the following hypothesis had been developed by the researcher:

H1: There is a relation between risk disclosure and investment efficiency.

The following Sub- hypotheses are derived from this main hypothesis.

H1a: There is a relation between risk disclosure and overinvestment.
H1b: There is a relation between risk disclosure and underinvestment.

6. Methodology of The Research

The research population is represented by companies registered on the Egyptian stock market. The study relied on a sample of non-financial companies listed on the stock market that are active in trading. To be included in a sample complete data should be available on them for the study period (2014-2018).

The nature of the study hypotheses and the variables of the study require the provision of financial statements and disclosure reports for the study period as it was obtained from the book of disclosures for the most active 50 companies issued by the Egyptian Stock Exchange, the Compass Egypt guide, and Egypt Company for Information Dissemination. By applying the previous criteria, the researcher was provided with a sample of 84 companies, 420 observations for the study period (2014-2018).

The researcher reviews the literature on risk disclosure variables, and content analysis will be used to build an index to disclose the financial and non-financial risks facing the company. The index consists of 30 items obtained from the financial reports and periodic disclosures published on the Egyptian Stock Exchange.

As for measuring the values of the other variables, the researcher will use secondary data that requires further processing from the companies' annual reports. To test the research hypotheses, the researcher also divided the sample into two groups: overinvestment and under investment in order to test the impact of risk information disclosure on investment efficiency, respectively. The researcher performs statistical analysis using SPSS package by conducting descriptive analysis, Pearson correlation analysis and multiple linear regression analysis.

6.1 Variable description

- **Dependent Variable**

Efficiency of the investment decisions

In measuring the efficiency of investment decisions, the researcher adopted the methodology presented by (Biddle et al., 2009) and used in some studies, eg., (Chen et al., 2011), which is based on measuring the efficiency of investment decisions with the difference between the value of the expected investments at the level of each company, and the actual value of the investments for each year, as follows:

- Estimate the expected investment

The first step to applying the methodology suggested by (Biddle et al.,2009) is to estimate the optimal level of investment expenditures. It has been assumed that investment expenditures are a function of future growth opportunities expressed.

The rate of growth in the basic revenues of the company, takes into consideration a number of independent variables affecting investment expenditures, such as: leverage, the rate of cash held, the size of the company and the market returns. Those variables are delayed (Lagging) for one period in order to avoid any possible bias between the Independent variables and dependent variables. To introduce the fixed effect for the sector (industry), and years within the independent model variables, the model included two dummy variables for the year and the industry respectively.

The optimum level of investment expenditures is estimated according to the following model for the cross – sectional and for each year.

$$Invest_{it} = \beta_0 + \beta_1 Growth_{it-1} + \beta_2 Lev_{it-1} + \beta_3 Cash_{it-1} + \beta_4 Size_{it-1} + \beta_5 Return_{it-1} + \beta_6 Invest_{it-1} + \beta_7 Age_{it-1} + \sum\beta_k Year + \sum\beta_j Industry + \varepsilon_{it} \quad (1)$$

Variables	Definition of variables
Invest $_{it}$	The investment expenditures which is the amount of spending for fixed assets, long-term investments, and intangible assets attributable to total assets for the period.
Growth$_{t-1}$	The growth rate in basic revenues, which is the change in net sales for the period relative to net sales for the period $_{t-1}$
LEV $_{it-1}$	The ratio of total debt to total assets for the period $_{t-1}$.
Cash $_{t-1}$	The balance of cash and cash equivalents to total assets for the period $_{t-1}$.
Size $_{it-1}$	The firm size expressed in natural logarithms of total assets for the period$_{t-1}$.
Returns $_{it-1}$	stock returns, the change in the market value of a stock for the period $_{t-1}$.
Invest $_{it-1}$ Industry& year	Investment expenditures for the period $_{t-1}$. Two dummy variables for the year and the industry respectively for the purpose of introducing the fixed effect
Age $_{it-1}$	Natural log of firms listed years.

- Deviation from the expected investment amount

In the light of the efficiency of investment decisions, the deviation from the estimated value of investment expenditures expressed in the model residual (Residuals) is equal to zero. Positive residuals indicate overinvestment (overinvest), while negative residuals of the model indicates a lack of investment (underinvest). Therefore, the researcher used the absolute value of the difference between the optimal level of estimated investment expenditures according to the model and the actual value of investment expenditures or what is known statistically as the residual of the model to express the efficiency of investment. (Chen et al., 2011)

- **Independent variable**

Risk disclosure

The study relied on measuring the level of risk disclosure on the method of content analysis in building a risk disclosure index that covers both financial and non-financial risks facing the company where the index consists of 30 items. This indicator has been prepared with the help of previous studies conducted in different environments (Al-Maghzom et al., 2016& Al- Kurdi et al., 2019& Kakanda et al., 2017& Abdallah et al., 2015) as shown in appendix No (1).

6.2 Control variables

The control variables refer to the independent variables that are not related to the objectives of the study, and at the same time they have an effect on the dependent variable that the study involves. The researcher believes that one of the important factors that may affect the results of the study is Firm-Specific characteristics. So the researcher has identified the following control variables and how to measure them. (Al-Maghzom et al., 2016& Elzahar and Hussainey,2012& Haj-Salem et al. 2019)

Variables	Definition of variables
Debt	The ratio of long-term liabilities to total assets
Operating cash flow rate (OCF)	Operating cash flows to total assets at the beginning of the period
Size	The natural log of total assets at the end of the year.
Surplus cash (Sucash)	The ratio of cash plus long-term investments to the net value of property and machinery.
Growth rate (Gwrate)	growth rate of revenue, the change in net sales for the period relative to net sales for the period

6.3 Research models

In testing the research hypotheses, the researcher relies on three linear regression models, whose independent variables are delayed (Lagging) for one period in order to avoid any possible bias between the independent variable (disclosure of risks) and the dependent variable (investment efficiency, over-investment, and shortage of Investment) as follows:

Model(A): Testing the effect of risk disclosure on investment efficiency.

$$Absinvest = \beta_0 + \beta_1 Riskdisc_{it-1} + \beta_2 Sucash_{it-1} + \beta_3 OCF_{it-1} + \beta_4 Debt_{it-1} + \beta_5 Size_{it-1} + \beta_6 Gwrate_{it-1} + \sum\beta\, kYear + \sum\beta\, jIndustry + \varepsilon \quad (2)$$

Whereas:

Absnvest $_{it}$: Investment efficiency of firm i in fiscal year $_{t}$.
Riskdis $_{it-1}$: Risk disclosure of firm i in fiscal year $_{t-1}$.
Sucash $_{it-1}$: Surplus cash of firm i in fiscal year $_{t-1}$.
OCF $_{it-1}$: Operating cash flow rate of firm i in fiscal year $_{t-1}$
Size $_{it-1}$: Natural log of total assets of firm in fiscal year $_{t-1}$.
Gwrate $_{it-1}$: Growth rate of revenue of firm i in fiscal year $_{t-1}$
Debt $_{it-1}$: The ratio of long-term liabilities to total assets of firm i in fiscal year $_{t-1}$

Model(B): Testing the effect of risk disclosure on overinvestment.

$$Overinvest_{it} = \beta 0 + \beta 1 Riskdisc_{it-1} + \beta 2\, Sucash_{it-1} + \beta 3\, OCF_{it-1} + \beta 4\, Debt_{it-1} + \beta 5\, Size_{it-1} + \beta 6\, Gwrate_{it-1} + \sum\beta\, kYear + \sum\beta\, jIndustry + \varepsilon \quad (3)$$

Whereas:

Overinvest it : overinvestment of firm i in fiscal year t.

Model(C): Testing the effect of risk disclosure on underinvestment.

$$Underinvest = \beta 0 + \beta 1 Riskdisc_{it-1} + \beta_2 Sucash_{it-1} + \beta_3 OCF_{it-1} + \beta_4 Debt_{it-1} + \beta_5 Size_{it-1} + \beta 6\, Gwrate_{it-1} + \sum\beta\, kYear + \sum\beta\, jIndustry + \varepsilon \quad (4)$$

Whereas:

Underinvest$_{it}$ **:** underinvestment of firm i in fiscal year t.

Table (1): Description of the research variables

Variables	Variable symbol	Definition of the variables
Independent variable		
Risk disclosure	Risk disc	The Percentage number of items in the index disclosed for each company to the total number of index items.
Dependent variables		
Investment efficiency	*Absinvest*	The Absolute value of the statistically residual from the model estimation (1).
Overinvestment	*Overinvest*	The positive value of the statistically residual from the estimation model (1).
Underinvestment	*Underin est*	The negative value of the statistically residual from the estimation model (1).
Control variables		
Debt	Debt	The ratio of long-term liabilities to total assets
Operating cash flow rate	OCF	Operating cash flows to total assets at the beginning of the period.
Size	Size	The natural log of total assets.
Surplus cash	Sucash	The ratio of cash plus long-term investments to the net value of property and equipment's.
Growth rate	Gwrate	Growth rate of revenue. The change in net sales for the period relative to net sales for the period

7-Results and discussion

When analyzing the data, the researcher relied on the Multiple Linear Regression Model to test the relationship between the dependent variable, independent variables and the control variables. But before presenting the results of the study models, the validity of the models must be verified. The extent to which the model is free from the problem of mullticolinearity between the independent and control variables was tested. The results of the test (Tolerance) and the (VIF) test as shown in table (2) indicate that the variables do not suffer from the problem of mullticollinearity, as the value of the (Tolerance) test is less than one at the level of all the variables of the model. (VIF) is less than (10) at the level of all the variables of the model. This indicates that there is no multicollinearity between the independent and control variables.

Table (2): Multi-collinearity test

Model	Collinearity Statistics	
	Tolerance	VIF
OCF	0.934	1.071
Risk disc	0.968	1.033
Debt	0.956	1.046
Size	0.682	1.467
Sucash	0.738	1.354
Gwrate	0.693	1.443

The researcher also relied on the test of Spearman correlation in order to verify the Heteroscedasticity between the dependent variable and the independent variables, and the results of the test showed that the coefficient of correlation in the first model between $|ei|$, $\hat{Y}$ (Absinvest) is insignificant, where: P-value = 0.762 > 5%. The coefficient of correlation in the second model between $|ei|$, $\hat{Y}$ (Overinvest) is insignificant, where: P-Value = 0.106 > 5%., and the coefficient of correlation in the third model between $|ei|$, $\hat{Y}$ (Underinvest) is insignificant, where: P-Value =0.082 > 5%. This indicates that there is a difference in the variances of all models.

7.1 Descriptive analysis

Table (3) shows descriptive analysis results of the research variables: Risk disclosure, investment efficiency, growth rate, surplus cash, Size, Debt, and Operating cash flow. The results of the descriptive analysis are for the data obtained from the Egyptian exchange market for the period (2014-2018).

Table (3): Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
OCF	420	.100	.953	.33803	.227320
Riskdisc	420	.001491	.570426	.10989247	.084267062
Debt	420	.02868	.97092	.5085751	.20499294
Size	420	7.144350	9.960218	8.41082033	.442599493
Sucash	420	.000287	.947235	.19557326	.168856837
Gwrate	420	.0030	.9697	.344044	.2379518
Absinvest	420	.00	.91	.0978	.10748
underinvest	180	.01	.35	.0953	.08465
overinvest	240	.00	2.64	.1124	.22264
Valid N (listwise)	420				

Table (3) shows the results of the minimum, maximum, mean and the standard deviation for the research variable risk disclosure that ranged from (0.014 to 0.570),with standard deviation (0.084) and mean (0.1098) ,investment efficiency ranged from (0.00 to 0.91) with mean (0.0978) and standard deviation(0.107),and debt of the company ranged from (0.028 to 0.97) with a mean (0.50) and standard deviation (0.20).

The results give an overview of the data that shows the existence of a wide range between the values of risk disclosure variables among the research sample firms. The results also showed that the firm size mean (log of total assets) is (8.4108) with a standard deviation of (0.4425994) and the mean of (surplus cash, growth rate, operating cash flow rate) are (0.1955 & 0.34404&.33803) respectively.

7.2 Correlation Analysis

The Pearson correlation analysis was performed to determine the direction and significance of correlation among the variables of the study (risk disclosure, investment efficiency, growth rate, Size, surplus cash, operating cash flow rate) as follows.

Table (4): Pearson correlation analysis

Correlations

		OCF	Riskdisc	Debt	Size	surcash	Gwrate	underinvest	overinvest	Absinvest
OCF	Pearson Correlation	1								
	N	420								
Riskdisc	Pearson Correlation	.104	1							
	Sig. (2-tailed)	.033								
	N	420	420							
Debt	Pearson Correlation	-.053	-.140	1						
	Sig. (2-tailed)	.276	.004							
	N	420	420	420						
Size	Pearson Correlation	-.002	.002	.169	1					
	Sig. (2-tailed)	.961	.969	.001						
	N	420	420	420	420					
surcash	Pearson Correlation	.150	-.027	-.078	.018	1				
	Sig. (2-tailed)	.002	.580	.112	.711					
	N	420	420	420	420	420				
Gwrate	Pearson Correlation	.218	.055	-.133	.150	.413	1			
	Sig. (2-tailed)	.000	.264	.006	.002	.000				
	N	420	420	420	420	420	420			
underinvest	Pearson Correlation	.142	.081	-.073	.032	-.100	.002	1		
	Sig. (2-tailed)	.057	.281	.333	.671	.182	.981			
	N	180	180	180	180	180	180	180		
overinvest	Pearson Correlation	.240	-.137	.375	.016	.459	.387	-.127	1	
	Sig. (2-tailed)	.000	.034	.000	.809	.000	.000	.089		
	N	240	240	240	240	240	240	180	240	
Absinvest	Pearson Correlation	.244	-.126	.186	.038	.490	.431	-.115	.882	1
	Sig. (2-tailed)	.000	.010	.000	.432	.000	.000	.125	.000	
	N	420	420	420	420	420	420	180	240	420

The results from table (4) shows the Pearson correlation matrix of the dependent variables, Investment efficiency (Absinvest), (overinvest), (underinvest), and the independent variable (risk disclosure). The results indicate that there is a negative correlation between the variable of risk disclosure and (Absinvest), with a value of (-0.126) at significance level of (0.010). This is indicates that the decrease in the information risk disclosure will increase in investment efficiency. This result is consistent with the divergence hypothesis, indicating strong variability of risk information between companies and investors.

Companies have low transparency of information and investors have a high perspective of risk. So they demand more payments to avoid uncertain risks, which may be unsuitable for the efficiency of investment (Kravet and Mulsu, 2013).

The results also indicate that there is a negative correlation between the variable of risk disclosure and (overinvest), with a value of (-0.137) at significance level of (0.034), and insignificant negative relation between risk disclosure and (underinvest) with a value of (0.081) at significance level of (0.281). It indicates that risk disclosure can enhance the efficiency of investment primarily by limiting inappropriate investment conduct) Yao and Zhao, 2016).

With regard to the control variables ,We also note that there is a positive correlation between the variable of operating cash flow rate and Investment efficiency with a value of(0. 244) at the level of (0.000).And also positive correlation with, Debt, Gwrate and Sucash with a level of (0.000& 0.000& 0.000) respectively.

7.3 Results of Multiple Linear Regression analysis

7.3.1 Results of the first hypothesis that test the relationship between risk disclosure and investment efficiency

Table (5): the relation between risk disclosure and investment efficiency

Variables	B	Std.Error	Beta	t	Sig	Collinearity Statistics	
						Tolerance	VIF
(Constant)	0.015	0.090		0.167	0.868		
OCF	0.105	0.029	0.149	3.600	0.000	0.938	1.066
Riskdisc	-0.273	0.084	-0.130	-3.242	0.001	0.969	1.031
Debt	0.099	0.031	0.130	3.168	0.002	0.925	1.081
Size	-0.009	0.011	-0.034	-.833	0.405	0.930	1.076
Sucash	0.252	0.030	0.362	8.307	0.000	0.820	1.220
Gwrate	0.165	0.027	0.277	6.174	0.000	0.771	1.297
Model significance assessment							
Adjusted R Square		0.347		F		38.155	
Significance (F)		0.000		Sample (N)		420	

The results of multiple linear regression in Table (5) shows the relation between risk disclosure and investment efficiency. The results indicate that there is a negative and significant relation between risk disclosure and investment efficiency with a value of (-0.273) at significance level of (0.001), meaning that in light of the increase (decrease) in risk disclosure, companies are less (more) in investment efficiency. This finding supports the first hypothesis that there is a relation between risk disclosure and investment efficiency. This result is consistent with the divergence hypothesis; that indicates that there is a clear variance of risk information. The asymmetry of information between market participants' and companies results due to uncertainty in the information environment and difficulties in interpreting risk disclosure (Campbll et al., 2014) because investors cannot determine the real conditions of the company. Market participants' may realize that the company faces enormous risks when the company discloses details about risk information, so they demand more compensation to avoid uncertain risks, in addition managers may use risk information to evaluate profitable projects, and this may affect the efficiency of the investment.

With regard to the control variables, the results indicated that there is a positive and significant relationship between operating cash flow rate, growth rate at significance level of (0.000&0.000) respectively, and investment efficiency. This result is consistent with the signal theory that the companies which are better at managing risk have a rate of growth in revenue and cash flows. This is evident through the disclosure in the annual reports and the disclosure of more risks.

It confirms the efficiency and transparency of management towards stakeholders. Disclosure of risks reduces information asymmetry and leads to an increase in the rate of revenue growth and cash flows, which is an important factor for the efficiency of investment decisions (Zulfikar et al., 2017).

The results also indicate that there is a positive and significant relation between surplus cash and investment efficiency at significance level of (0.000). This result is consistent with the signal theory that suggests companies with large surplus cash disclose more risk-related information in order to send signals to stakeholders about the company's ability to manage risk. This may be reflected in the efficiency of the investment (Elzahar and Hussainey,2012).

The results also showed that there is a positive and significant relation between investment efficiency at significance level of (0.002).Companies with high debt may have strong incentives to disclose risks to reduce agency costs and meet debt holders of information needs, which may represent a signal from the company on its ability to manage risks and pay obligations and its high financial flexibility, reflected in the case of obtaining financing and the efficiency of investment decisions.

This is in agreement with the findings of the study (Nahar et al., 2016 (b)). This may contradict the findings of a study (Elzahar and Hussainey, 2012), which found an insignificant relationship between disclosure of risks and the resort to debt as a source of financing.

7.3.2 Results of the hypothesis that test the relationship between risk disclosure and Overinvestment.

Table (6): the relation between risk disclosure and overinvestment.

Variables	B	Std.Error	Beta	t	Sig	Collinearity Statistics	
						Tolerance	VIF
(Constant)	0.024	0.106		0.228	0.820		
OCF	0.135	0.043	0.156	3.162	0.002	0.901	1.110
Riskdisc	-0.266	0.132	-0.096	-2.014	0.045	0.973	1.028
Debt	0.229	0.036	0.311	6.342	0.000	0.912	1.096
Size	-0.023	0.013	-0.090	-1.837	0.068	0.913	1.095
Sucash	0.278	0.043	0.371	6.421	0.000	0.656	1.525
wrate	0.203	0.038	0.313	5.339	0.000	0.637	1.570
Model significance assessment							
Adjusted R Square		0.477		F		37.354	
Significance (F)		0.000		Sample (N)		240	

Table (6) shows the relation between risk disclosure and over investment. The results indicate a negative and significant association between overinvestment and risk disclosure with a value of (-0.266) at significance level of (0.045). It shows that risk disclosure can limited the behavior of over investment. It indicates that risk disclosure can primarily improve investment activity. This may be because when a company has more risk disclosure, it also has a strong risk perception and, therefore, is careful to conduct its business as a result; its investment effectiveness of the business increases. (Yao and Zhao ,2016)

7.3.3 Results of the hypothesis that test the relationship between risk disclosure and underinvestment.

Table (7): the relation between risk disclosure and under investment.

Variables	B	Std. Error	Beta	t	Sig	Collinearity Statistics	
						Tolerance	VIF
(Constant)	-.688	0.070		-9.805	0.000		
OCF	0.039	0.027	0.038	1.422	0.157	0.943	1.060
Risk disc	-0.139	0.071	-0.114	-1.959	0.052	0.944	1.059
Debt	0.022	0.030	0.041	.713	0.477	0.958	1.044
Size	0.090	0.008	0.648	11.373	0.000	0.987	1.014
Sucash	0.047	0.063	0.043	.747	0.456	0.965	1.037
Gwrate	0.037	0.028	0.077	1.329	0.186	0.967	1.034
Model significance assessment							
Adjusted R Square		0.426		F		23.158	
Significance (F)		0.000		Sample (N)		180	

Table (7) shows the relation between risk disclosure and underinvestment. The results indicate that there is a negative and insignificant relation between disclosure and underinvestment, meaning that disclosure of more information about risks may entail awareness the investors believe, that the company faces great risks and needs compensation to avoid it, or even cancel their equity ownership. The insufficient capital will lead to underinvestment.

8. Conclusion

This study aims to test the impact of risk disclosure on investment efficiency using risk disclosure data in annual reports of Egyptian registered on companies for the period (2014-2018). The results show that there is a negative and significant relation between risk disclosure and investment efficiency. This finding supports the validity of the first hypothesis that there is a relation between risk disclosure and investment efficiency. This result is consistent with the divergence hypothesis.

The study also divided the sample into two groups: overinvestment and underinvestment, to test the impact of annual risk disclosure on investment conduct. The results show a negative and significant relation between the overinvestment group and risk disclosure, it indicates that disclosure of information risks can enhance investment efficiency primarily by limiting ineffective investment conduct. This may be because it also has a clear understanding of risk as a company has more risk disclosure, and is thus careful in conducting its business. Therefore, its performance in investment increases, while it is insignificant in the underinvestment group and risk disclosure. The results also show that there is a positive and significant relationship between operating cash flow rate, growth rate, surplus cash, and investment efficiency. This result is consistent with the signal theory that indicates companies that are better at managing risk have a rate of growth in revenue and cash flows. Disclosure of risks reduces information asymmetry and leads to an increase in the rate of revenue growth and cash flows, which is an important factor for the efficiency of investment decisions.

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Appendix (1):

Serial	Category and type of reported risks
First	**Financial risks**
1	Pricing Risk
2	Liquidity risk
3	Credit risk
4	Changes in Interest Rates
5	Change in fair value
6	Market Risk
7	Interest Rate
8	Currency risk
9	Exchange Rate
10	Commodity risk
11	Capital Adequacy
12	Credit Risk
13	Sustainability Risk
14	Insurance Risk
15	Derivatives
16	Cash flow hedge
Second	**Non–financial Risks**
17	Product Development
18	Customer Satisfaction
19	Outsourcing
20	Natural Disasters
21	Brand Name Erosion
22	Product and Service failure
23	Stock Obsolescence and Shrinkage
24	Change in technology
25	Physical Disasters
26	Equity risks
27	Competition
28	Performance Measurement
29	Communication
30	Health and safety