

**ERASMUS UNIVERSITY ROTTERDAM**

Erasmus School of Economics

Master Thesis

Accounting, Auditing, & Control

**Macroeconomic Factors and Earnings Management**

Name student: Floor Maria Yvonne Euser

Student ID number: 510026

Supervisor: Dr. Y. Li

Second assessor: Dr. J. Bae

Date final version: 27-06-2023

The content of this thesis is the sole responsibility of the author and does not reflect the view of either the supervisor, second assessor, Erasmus School of Economics or Erasmus University.

### **Abstract**

It is important to investigate whether macroeconomic factors influence earnings management, because earnings management can have consequences for several stakeholders. This research focusses on two macroeconomic factors: the inflation rate and the unemployment rate. This research measures accrual earnings management with the discretionary accruals and real earnings management with the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs. This research uses historical data from 2010-2021 and obtains 6,830 firm-year observations. The results of this study suggest a negative relation between the inflation rate and both accrual and real earnings management. The results indicate no relation between the unemployment rate and both accrual and real earnings management. Furthermore, this research finds that monitoring mitigates the relations between the investigated macroeconomic factors and earnings management. The findings of this research contribute to prior literature because prior literature found different relations between the investigated macroeconomic factors and earnings management when measuring earnings management with a more extreme form of earnings management (i.e. fraud) instead of measuring earnings management with accrual and/or real earnings management.

**Key words:** macroeconomic factors, inflation rate, unemployment rate, earnings management, accrual earnings management, real earnings management, discretionary accruals, abnormal discretionary expenses, abnormal operating cash flow, abnormal production costs

## Table of Contents

1. Introduction .....	1
2. Theoretical Background and Hypotheses Building.....	4
2.1. Earnings Management.....	4
2.2. Macroeconomic Factors .....	5
2.3. The Fraud Triangle.....	5
2.4. Hypotheses .....	6
2.4.1. The Inflation Rate.....	6
2.4.2. The Unemployment Rate .....	7
2.4.3. Monitoring.....	8
3. Methodology .....	9
3.1. Estimation Models.....	9
3.1.1. Accrual Earnings Management and Real Earnings Management.....	9
3.1.2. The Inflation Rate and the Unemployment Rate on Earnings Management.....	10
3.1.3. Monitoring.....	12
3.2. Data .....	13
4. Results .....	13
4.1. Descriptive Statistics .....	13
4.2. The Inflation Rate, the Unemployment Rate, and Earnings Management.....	14
4.2.1. Additional Analysis of the Inflation Rate, the Unemployment Rate, and Earnings Management.....	18
4.3. Macroeconomic Factors, Monitoring, and Earnings Management .....	18
5. Conclusion.....	25
5.1. Contribution to Prior Literature.....	26
5.2. Limitations and Future Research.....	27
6. Bibliography.....	29
A. Appendix A .....	34
B. Appendix B .....	36
C. Appendix C .....	37
D. Appendix D .....	38

## 1. Introduction

There are several famous cases of earnings management. For example, Toshiba and Luckin Coffee inflated their earnings by, respectively, 1.2 billion euro and 300 million euro (The Guardian 2015; McGregor 2022). A reason for managers to engage in earnings management is to mislead stakeholders about the real economic performance of the firm and to influence stock prices (Healy and Wahlen 1999). Studies found that approximately 10 percent of the earnings per share are managed, but it is hard for investors and other stakeholders to detect the differences between the managed earnings and the fundamental earnings (Dichev, Graham, Harvey, and Rajgopal 2013; Beyers, Guttman, and Marinovic 2019). Due to earnings management, stakeholders might perceive the economic value of a firm differently than the true economic value of that firm. Some studies suggest that investors perceive abnormal accruals differently than normal accruals, however, they explain that investors still do tend to overreact to the data of abnormal accruals (Defond and Park 2001; Dechow, Ge, and Schrand 2010). There is a negative association between abnormal accruals and stock returns in the future. This has a negative effect on the financial wealth of shareholders. Real earnings management can have a negative effect on the financial wealth of stakeholders. For example, real earnings management is linked to lower earnings and cash flows in the future (Gunny 2005).

Due to the consequences of earnings management, it is important to examine circumstances that influence managers' willingness to engage in earnings management. This paper focusses on how macroeconomic factors influence the amount of earnings management. Several macroeconomic factors are the highest or lowest they have been in a long time. The inflation year-over-year rate in 2022 was at the highest level since 1981 (Winters, 2022). In the Netherlands, the inflation rate was higher than 10 percent in 2022, this was the highest it had been since 1975 (Swagerman 2023). In 2022 the unemployment rate was at its lowest since 1969 (Malinsky, 2023). If these factors influence managers' willingness to engage in earnings management and organizations do not take these factors into consideration during their risk analyses, the amount of earnings management might increase. As explained, this can have negative consequences for stakeholders. Due to the extreme values of some macroeconomic factors, it is important to investigate how these factors affect earnings management. Therefore, the research question leads: *Do macroeconomic factors influence the amount of earnings management?*

To investigate whether macroeconomic factors influence the amount of earnings management, this study investigates two macroeconomic factors. This study examines the relation between the inflation rate and earnings management and the relation between the unemployment rate and earnings management. Therefore, the first two sub-questions are: *Is there a relation between the inflation rate and earnings management?* and *Is there a relation between the unemployment rate and earnings management?*

If the results suggest a relation between the inflation rate or the unemployment rate and the amount of earnings management, stakeholders, companies, auditors, and the government do not know in which circumstances this relation is different. When stakeholders, companies, auditors, and the government know when the relation is different, they can use this when analyzing companies or to reduce earnings management (Healy and Wahlen 1999; Culp 2002; Dechow et al. 2010). This paper therefore examines whether the relation between the inflation rate and earnings management and the relation between the unemployment rate and earnings

management is different in companies with stronger monitoring. The third sub-question is formulated as follows: *Does monitoring affect the relations between the examined macroeconomic factors and earnings management?*

This study contributes to existing literature because not a lot of studies have investigated the relation between macroeconomic factors and earnings management (Gava and Vitiello 2014; Mustafa and Khan 2020; Omarkhanlen, Tometi, and Urhie 2021). Studies that did investigate the relation between macroeconomic factors and earnings management did not investigate this relation with the discretionary accruals or the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs. These studies also did not investigate the data of enlisted companies in the United States. However, studies frequently assume a relation between macroeconomic factors and earnings management (e.g. Leuz, Nanda, and Wysocki 2003; Braam, Nandy, Weitzel, and Lodh 2015; Enomoto, Kimura, and Yamaguchi 2015). To make this assumption more research should be provided.

Several studies suggest that earnings management decreased during the 2007-2008 financial crisis (Habib, Uddin Bhuiyan, and Islam 2013; Filip and Raffournier 2014; Cimini 2015; Dimitras, Kyriakou, and Latridis 2015). The macroeconomic factors changed significantly during the crisis relatively to precrisis (Ball and Mazumder 2011; U.S. Bureau of Labor Statistics n.d.). Some studies measure the start of the financial crisis by measuring when there was a significant change in macroeconomic conditions or specifically state that they want to measure the impact of macroeconomic conditions. Thus, it is likely that the found relation between the financial crisis and earnings management exists (partly) due to the change in macroeconomic factors. As mentioned, there is almost no research about the relation between macroeconomic factors and earnings management after the financial crisis, therefore it is not certain whether this relation exists only in extreme circumstances (i.e. a crisis) or whether this relation always exists.

This research uses historical data of the personal consumption expenditures price index per state to calculate the inflation rate. Historical data about the unemployment rate per state is used to measure the unemployment rate. This research uses the discretionary accruals to measure accrual based earnings management and the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs to measure real earnings management. The discretionary accruals are measured with the residuals of the accruals model, the abnormal discretionary expenses are measured with the residuals of the discretionary expenses model, the abnormal operating cash flow is measured with the residuals of the operating cash flow model, and the abnormal production costs are measured with the residuals of the production costs model. Monitoring is measured with the average analysts following and the percentage of institutional ownership.

This study uses data from the Federal Reserve Bank of Saint Louis, the Compustat database, the Thomson Reuters 13f file, and the Institutional Brokers Estimates System (IBES). The sample period is 2010-2021. After merging the databases the sample consist of 6,830 observations, representing 1,305 firms. This study regresses the rates of the macroeconomic factors and the lagged rates of the macroeconomic factors on either the discretionary accruals or the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs.

The results of this study suggest an overall negative relation between the inflation rate and both accrual and real earnings management. The results of this study suggest no overall relation between the unemployment rate and both accrual and real earnings management. Consistent with prior literature, this study finds that monitoring mitigates the relations between the examined macroeconomic factors and earnings management.

The findings of this study show different relations between the examined macroeconomic factors and the less extreme forms of earnings management (i.e. accrual earnings management and real earnings management) compared to the relations found by prior studies when measuring earnings management with an extreme form of earnings management (i.e. fraud) (Gava and Vitiello 2014; Mustafa and Khan 2020; Omankhanlen et al. 2021). This study provides insights for the literature about the financial crisis and earnings management. Studies found that there was a decrease in earnings management during the 2007-2008 financial crisis (Habib 2013; Filip and Raffournier 2014; Cimini 2015; Dimitras et al. 2015). Other studies found that the inflation rate decreases during a crisis (Stock and Watson 2010; Ball and Mazumder 2011). This study finds a negative relation between the inflation rate and earnings management. Therefore it is possible that the change in other factors during the financial crisis has a larger effect on earnings management.

The findings of this study complement prior studies that examined the moderating effect of monitoring on the relation between factors that influence earnings management and earnings management (Rajgopal, Venkatachalam, and Jiambalvo 1999; Chung, Firth, and Kim 2002; Klein 2002; Yu 2008). The findings suggest that the average analysts following a firm and the percentage of institutional ownership mitigate the relations between the investigated macroeconomic factors and earnings management.

The results of this research have implications for stakeholders, because it is important to know in which circumstances earnings management is more likely to occur. As mentioned, it is difficult for stakeholders to detect earnings management. However, when stakeholders know in which macroeconomic environment earnings management is more likely, they can anticipate when the risk of earnings management is higher. For example, Dechow et al. (2010) explain that when investors observe situations where earnings management is more probable, they incorporate this effect on the price. Next to that, when stakeholders know the mitigating effect of monitoring they can take this into account when analyzing different companies with different monitoring structures.

Additionally, if companies know when managers' willingness to engage in earnings management is higher, they can take this into consideration during their risk management process and thereby optimize their internal controls and reduce the chance of earnings management (Culp 2002). Standard setters are interested in the motives for engaging in earnings management (Healy and Wahlen 1999). Besides that, an auditor's responsibility is to give reasonable assurance that the financial statement amounts do not contain any material misstatement due to intentional or unintentional errors (Geiger 1994). When auditors can anticipate on the probability of intentional errors (due to earnings management), they can take this into account in their processes and may increase the probability of detecting intentional errors.

The remainder of the paper is structured as follows. Section 2 examines related literature and forms the hypotheses. Section 3 describes the methodology and the data. Section 4 discusses the results, and section 5 presents the conclusion.

## **2. Theoretical Background and Hypotheses Building**

This section explains earnings management, the inflation rate, and the unemployment rate. In addition, the fraud triangle is described, because this theory is used to form the hypotheses. In this section the hypotheses are formed.

### **2.1. Earnings Management**

There is not a specific definition for earnings management. However, earnings management is frequently described as the exploitation of accounting techniques and the use of judgment by managers to change financial accounting numbers (Healy and Wahlen 1999). Companies use earnings management to present their financial performance differently than the economic reality. They do this to mislead certain stakeholders or to affect contractual outcomes that rely on these accounting numbers.

Accrual earnings management and real earnings management are two types of earnings management. Accrual earnings management refers to changes in accounting standards or estimates to alter the earnings. When managers use accrual earnings management they take advantage of the large amount of subjectivity in estimations to manage the earnings (Healy and Wahlen 1999). An example of accrual earnings management is a company depreciating less depreciation expenses compared to the 'real' depreciation costs. Real earnings management is generally applied when managers deviate operating, investment, or financing activities from normal business practices to change the financial accounting numbers (Xu, Taylor, and Dugan 2007; Cohen and Zarowin 2010). It is achieved by timing these business practices. Examples of real earnings management are reducing research and development costs in certain periods or giving price discounts to temporarily improve the sales (Roychowdhury 2006).

There are several reasons to manage earnings. A large amount of studies investigated the effect of analysts' forecasts on earnings management (Payne and Robb 2000; Dhaliwal, Gleason, and Mills 2004; Athanasakou, Strong, and Walker 2009). These studies found that managers manage earnings to beat or just meet analysts' forecasts. Besides that, organizations that are close to debt covenant violation engage more in earnings management than organizations that are not close to debt covenant violation (Jaggi and Lee 2002; Franz, HassabElnaby, and Lobo 2014). An increase in a managers private finances can also be a reason to manage earnings (Healy 1985; Bergstresser and Philippon 2006). For example, when managers are not able to reach their targets without earnings management, they are more likely to engage in earnings management. Additionally, managers engage in earnings management to smooth incomes, because stakeholders generally prefer stable firms and smooth incomes result in relatively stable bonuses (Matsuura 2008).

Earnings management can have consequences for several stakeholders. Studies suggest that the difference between the managed earnings and the fundamental earnings are hard to detect and therefore stakeholders might perceive the economic value of a firm differently compared to the true economic value of the firm (Dichev et al. 2013; Beyer et al. 2019). Other studies found that investors overreact to the data of abnormal accruals and that there is a negative association between abnormal accruals and stock returns in the future (Defond and

Park 2001; Dechow et al. 2010). Gunny (2005) examines the consequences of real earnings management. She found that real earnings management is linked to lower future cash flows and lower future earnings because of myopic behavior of managers. This myopic behavior results in decisions (e.g. investments, cutting prices) that are not the most favorable for stakeholders in the long run.

## **2.2. Macroeconomic Factors**

Macroeconomic factors are factors that are not related to a specific part of a population, but macroeconomic factors are related to the whole (or a large part of the) population (Cambridge Dictionary, n.d.). These factors are economic factors that are measured on national level (or state level). This research focusses on the following macroeconomic factors: the inflation rate and the unemployment rate.

The inflation rate shows the increase of prices relative to the prices of previous periods. Inflation is a continuous rise in the level of prices (Cambridge Dictionary, w.d). Inflation affects the purchasing power of money (Omidi, Min, and Omidi 2017). If the inflation increases, entities can buy less with the same amount of money. The increase in the price levels can cause a decrease in an entity's morality (Wong 1992). Inflation can cause uncertainty about future prices. Some types of economic interactions negatively change due to inflation; higher inflation increases the complexity of contracts, increases the number of meetings regarding the contracts, and can lead to the contracts being evaded altogether (Heymann and Leijonhufvud 1995). Besides that, most firms evade long term commitments when there are high inflation rates. Heymann and Leijonhufvud (1995) suggest that high inflation can induce inefficiencies in the market.

The unemployment rate is a percentage that shows the number of unemployed workers compared to the labor force (U.S. Bureau of Labor Statistics 2023). The labor force contains both the employed and unemployed workers. A person is considered unemployed if they want to work and are actively looking for work. It is possible that there is a tight labor market or that there is a loose labor market. A tight labor market is generally associated with a low unemployment rate and a loose labor market is generally associated with a high unemployment rate. In a tight labor market there is a large demand for workers and the supply is smaller than the demand (Remery, Henkens, Schippers, and Ekamper 2003). In a loose labor market the supply for workers is larger than the demand.

## **2.3. The Fraud Triangle**

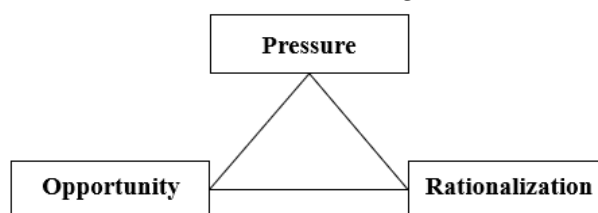
This section explains the fraud triangle. Studies found a link between the fraud triangle and fraudulent financial reporting (Lou and Wang 2009; Manurung and Hadian 2013; Huang, Lin, Chiu, and Yen 2017; Fitri, Syukur, and Justisa 2019). Some of these studies use proxies of earnings management to find this link (e.g. the discretionary accruals). Huang et al. (2017) explain that earnings management is regularly used to engage in fraudulent financial reporting. Dechow and Skinner (2000) state that fraud is an extreme form of earnings management. Additionally, Perols and Lougee (2011) found that companies that engage in less extreme forms of earnings management compared to fraud, have a higher probability to commit fraud in the future. Because of these findings, it is expected that the fraud triangle applies to earnings management as well.

Cressey (1950) investigated why people commit fraud and named this the fraud triangle. He found three main factors that influence a person to commit fraud. The first factor is that a



person perceives a pressure to violate the trust. The violator generally perceives their financial problem as non-shareable and therefore wants to solve the problem with secret resources. It is possible that the problem is easily communicable and might be easy to solve, however it depends on the violator perceiving the problem as non-shareable (Schuchter and Levi 2016). The second factor is that the person has the opportunity to solve the problem by committing a violation of trust, with a low probability of getting caught. The last factor implies that the violator can rationalize their violation of trust. Cressey (1953) explains that most violators rationalize their violation to perceive it as justifiable or acceptable, despite knowing their behavior is illegal and wrong. The fraud triangle is shown in Figure 1 (Wells 2017).

**Figure 1**  
*The Fraud Triangle*



## 2.4. Hypotheses

In this section the hypotheses are formed. There is not a lot of research on the relations between the inflation rate and earnings management and the unemployment rate and earnings management. However, studies that did investigate the relations between the macroeconomic factors and earnings management will be discussed to form the hypotheses. Additionally, the consequences of changes in the inflation rate and changes in the unemployment rate are linked to the fraud triangle to form the hypotheses.

### 2.4.1. The Inflation Rate

This section forms the hypothesis on the relation between the inflation rate and earnings management. The hypothesis is formed based on previous studies and the fraud triangle.

Gava and Vitiello (2014) examined the relation between inflation and fraud by investigating the balance sheets of Brazilian companies. They suggested a positive relation between inflation and a company's decision to report fraudulent financial statement amounts. Gava and Vitiello (2014) showed that companies are more likely to report intentional misstatements when there is high inflation compared to low inflation.

Other studies investigated the relation between financial crises and earnings management. These studies found that there is less earnings management during a recession (Habib 2013; Filip and Raffournier 2014; Cimini 2015; Dimitras et al. 2015). There is a high probability that the inflation rate falls prior to a recession and during a recession (Stock and Watson 2010; Ball and Mazumder 2011). Therefore, it is possible that a decrease in inflation is part of the reason of the relation between financial crises and earnings management.

Several studies examined the effect of inflation on growth. Bruno (1993) and Little (1993) found that high inflation represses a company to growth. Fischer (1993) suggests that not only high inflation but inflation overall is negatively correlated with growth. Ghosh and

Phillips (1998) found a negative relation between the inflation rate and a company's growth for all inflation rates except the lowest inflation rate.

Linking the consequences of inflation to the fraud triangle, the pressure of companies to commit earnings management might increase if the inflation rate is high. As mentioned in section 2.2, inflation can create inefficiencies in the credit market (Heymann and Leijonhufvud 1995). Besides that, it takes more effort to get a contract or contracts are avoided altogether when the inflation rate is relatively high. The more effort needed to agree on a contract or the avoidance of the contracts altogether, might reduce a companies profitability. The inefficiencies in the credit market and the likely reduction in profit can increase a companies incentives to engage in earnings management, because these effects can make it harder to meet or just beat analysts' forecasts, to prevent debt covenant violations, or to achieve a specific target and thereby earn a bonus. The found negative relation between the inflation rate and a company's growth might pressure managers to commit earnings management, because it might become harder to achieve the targets and thereby earn a bonus (Bruno 1993; Fischer 1993; Philips 1998).

The opportunity to commit earnings management might increase because inflation can cause uncertainty about future prices (Wong 1992). This uncertainty might give managers more flexibility to engage in earnings management with a lower probability of getting caught. For example, it takes less effort to convince people to change the way the depreciation is estimated when there is more uncertainty about future prices.

A higher inflation rate makes it easier to rationalize engaging in earnings management if managers focus on the short term effects of engaging in earnings management. As mentioned, high inflation regularly results in lower profits. Lower profits are generally associated with lower stock prices, which is generally negative for shareholders (Hunjra, Ijaz, Chani, and Mustafa 2014). When managers engage in earnings management the profits appear higher, this has a positive effect on the stock prices. Therefore, managers might rationalize engaging in earnings management when they focus on the short term effects of earnings management for shareholders. The mechanism 'advantageous comparison' makes this rationalization easier (Brown 2014). As mentioned, Gava and Vitiello (2014) found a positive relation between inflation and financial statement fraud in Brazilian companies. When managers engage in less extreme forms of earnings management, they might rationalize these actions by explaining to themselves that they do not engage in more extreme forms of earnings management (e.g. fraud).

Based on the above arguments, the following hypothesis is proposed:

*Hypothesis 1: There is a positive relation between the inflation rate and earnings management.*

#### **2.4.2. The Unemployment Rate**

This section describes the relation of the unemployment rate and earnings management. The hypothesis is formed based on the results of studies that examined the relation between the unemployment rate and fraud, studies about labor markets, and the fraud triangle.

Some studies examined the relation between the unemployment rate and financial statement fraud. These studies found a positive relation between the unemployment rate and earnings management. Mustafa and Khan (2020) investigated the relation between the unemployment level and the number of accounting frauds in the United Arab Emirates. They found that a rise in the unemployment rate positively influences the frequency of accounting frauds. Omankhanlen et al. (2021) found a positive relation between the unemployment rate and the occurrence of fraud in Nigerian banks. As mentioned in section 2.3, studies suggest that

fraud is a form of earnings management (Dechow and Skinner 2000; Huang et al. 2017). Therefore, it is likely that these results apply to less extreme forms of earnings management as well.

Other studies found a link between the conditions of the labor market and earnings management. Bowen, DuCharme, and Shores (1995) and Gao, Zhang, and Zhang (2018) suggest that companies use earnings management to increase the income of the company in order to decrease the costs of hiring workers and employee retention. They explain that managers do this to keep tacit promises to employees about, for example, job certainty. When the labor market is tight the demand for work is higher compared to the supply, thus it is relatively easy for employees to find a new job and harder for companies to find new employees (Remery et al. 2003). Therefore, it might be even more important to value the tacit promises.

The law of supply and demand explains that the wages of employees will presumably go up in a tight labor market (Gale 1955). When wages increase, the fixed costs of a company increase. On the other hand, when the unemployment rate is high and the supply for labor is high, the law of supply and demand suggests that wages go down and thereby the fixed costs decrease.

Relating the above findings to the fraud triangle, the pressure to engage in earnings management might increase when there is a tight labor market (i.e. a low unemployment rate). The findings of Bowen et al. (1995) and Gao et al. (2018) show that companies engage in earnings management to retain employees and to reduce the cost of hiring new employees. When the labor market is tight, it might be even more important to retain employees and more costly to hire new employees because the supply for new employees is smaller than the demand (Remery et al. 2003). Therefore, the pressure to use earnings management to inflate earnings might be higher. Besides, the costs of a company can rise because the wages rise (Gale 1955). Due to the rise of the costs it might be harder for managers to achieve the targets and earn a bonus, prevent debt covenant violations, or meet or beat analysts' forecasts. This might pressure managers to engage in earnings management.

It is likely that the opportunity to engage in earnings management does not change. However, a lower unemployment rate makes it easier for managers to rationalize engaging in earnings management. Managers can emphasize that they cannot influence the increase in fixed costs. They might perceive it as unfair that the increase in fixed costs influences the probability of obtaining their targets. They can explain to themselves that it is fair to engage in earnings management to increase the probability of achieving the targets. The advantageous comparison mechanism makes this rationalization easier, because managers can explain to themselves that they do not engage in a more extreme form of earnings management (e.g. fraud) (Brown 2014).

Due to the contradictory arguments of the results of studies that examined the relation between the unemployment rate and earnings management and the findings that are linked to the fraud triangle, the following hypothesis is proposed:

*Hypothesis 2: There is no relation between the unemployment rate and earnings management.*

### **2.4.3. Monitoring**

If the results show a significant relation between the inflation rate and/or the unemployment rate and earnings management, it is important to investigate in which circumstances this relation is different. If stakeholders know when the relations of the macroeconomic factors and earnings management are different, they can anticipate this when

making assumptions and decisions (Dechow et al. 2010). Besides that, if the findings show that a factor reduces earnings management, companies, stakeholders, and the government can use this to reduce earnings management (Healy and Wahlen 1999; Culp 2002). This paper examines whether the relations between the inflation rate and earnings management and the unemployment rate and earnings management is different in companies with stronger monitoring.

Several studies found that companies with stronger monitoring are less likely to engage and are less able to participate in earnings management (Rajgopal et al. 1999; Chung et al. 2002; Klein 2002; Yu 2008). Studies suggest that monitoring mitigates the relations between factors that influence earnings management and earnings management (Davidson, Goodwin-Stewart, and Kent 2005; Marra, Mazzola, and Prencipe 2011; Ali and Zhang 2015; Hessayri and Saihi 2015). Therefore, companies with stronger monitoring will most likely increase their earnings management less compared to companies with weaker monitoring. This leads to the following hypotheses:

*Hypothesis 3: The relation between the inflation rate and earnings management is smaller in companies with stronger monitoring.*

*Hypothesis 4: The relation between the unemployment rate and earnings management is smaller in companies with stronger monitoring.*

### 3. Methodology

This research investigates whether macroeconomic factors influence the amount of earnings management and whether monitoring affects this relation. This study is a correlational study that uses statistical data to determine the relations between the inflation rate and earnings management and the unemployment rate and earnings management. This section describes the models and variables used to test these relations. This section also discusses the databases used to test the relations. Table A in appendix A shows the descriptions of the variables.

#### 3.1. Estimation Models

This paper uses the discretionary accruals to measure accrual based earnings management and this paper uses the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs to measure real earnings management. Earnings management is expected to be higher when the discretionary accruals are higher or the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs is lower (Dechow, Richardson, and Tuna 2003).

Section 3.1.1 regresses the models used to estimate the discretionary accruals and the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs. Section 3.1.2 regresses the macroeconomic factors on either the discretionary accruals or the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs. Section 3.1.3 includes monitoring as interaction term.

##### ***3.1.1. Accrual Earnings Management and Real Earnings Management***

The discretionary accruals are used to test accrual based earnings management. This paper uses the accruals model presented by McNichols (2002) to estimate the discretionary accruals. McNichols combines the models of Jones (1991) and Dechow and Dichev (2002). McNichols' model is still used in recent studies (e.g. Zalata, Ntim, Choudhry, Hassanein, and

Elzahar 2019; Hsieh, Kim, Wang, and Wang 2020; Lassoued and Khanchel 2021; Zaman, Atawnah, Haseeb, Nadeem, and Irfan 2021). Equation 1 shows the accruals model.

$$ACC_{it}/A_{it-1} = \alpha_0 + \alpha_1 CFO_{it-1}/A_{it-2} + \alpha_2 CFO_{it}/A_{it-1} + \alpha_3 CFO_{it+1}/A_{it} + \alpha_4 \Delta S_{it}/A_{it-1} + \alpha_5 PPE_{it-1}/A_{it-1} + \varepsilon_{it} \quad (1)$$

$ACC_{it}$  represents the accruals of company  $i$  in year  $t$ , estimated by earnings before extraordinary items minus cash flow from operations.  $A_{it-1}$  contains the total assets of company  $i$  at the beginning of year  $t$ .  $CFO_{it}$  ( $CFO_{it-1}$ ,  $CFO_{it+1}$ ) represents the cash flow from operations of firm  $i$  in year  $t$  ( $t-1$ ,  $t+1$ ).  $\Delta S_{it}$  is the change in sales revenue of company  $i$  in year  $t$  compared to year  $t-1$  and  $PPE_{it-1}$  is the gross property, plant, and equipment of company  $i$  at the beginning of year  $t$ . The residuals ( $\varepsilon_{it}$ ) are measured annually for each two-digit Standard Industry Code. The residuals are used to measure the discretionary accruals.

The abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs are calculated to test real earnings management. This paper uses Roychowdhury's (2006) cross-sectional models, shown in equations 2.1, 2.2, and 2.3, to estimate, respectively, the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs. Recent studies also use these models to determine the amount of real earnings management (e.g. Darmawan, Sutrisno, and Mardiaty 2019; Li, Li, Xiang, and Djajadjkerta 2020)

$$Discretionary\ expenses_{it}/A_{it-1} = \beta_0 + \beta_1(1/A_{it-1}) + \beta_2(S_{it-1}/A_{it-1}) + \varepsilon_{it} \quad (2.1)$$

$$CFO_{it}/A_{it-1} = \beta_0 + \beta_1(1/A_{it-1}) + \beta_2(S_{it-1}/A_{it-1}) + \beta_3(\Delta S_{it}/A_{it-1}) + \varepsilon_{it} \quad (2.2)$$

$$PROD_{it}/A_{it-1} = \beta_0 + \beta_1(1/A_{it-1}) + \beta_2(S_{it-1}/A_{it-1}) + \beta_3(\Delta S_{it}/A_{it-1}) + \beta_4(\Delta S_{it-1}/A_{it-1}) + \varepsilon_{it} \quad (2.3)$$

$Discretionary\ expenses_{it}$  (equation 2.1) represents the discretionary expenses of company  $i$  in year  $t$ . The discretionary expenses are estimated with the sum of the advertising expenses, the research and development expenses, and the selling, general, and administrative expenses of company  $i$  in year  $t$ .  $CFO_{it}$  (equation 2.2) contains the cash flow of operations of company  $i$  in year  $t$ .  $PROD_{it}$  (equation 2.3) represents the production costs of company  $i$  in year  $t$ . The production costs are estimated with the sum of the cost of goods sold of company  $i$  in year  $t$  and the change in inventory of company  $i$  in year  $t$  compared to year  $t-1$ .  $A_{it-1}$  represents the total assets of company  $i$  at the beginning of year  $t$  and  $S_{it-1}$  contains the total sales of company  $i$  in year  $t-1$ .  $\Delta S_{it}$  is the change in sales revenue in year  $t$  compared to year  $t-1$  and  $\Delta S_{it-1}$  is the change in sales revenue in year  $t-1$  compared to year  $t-2$ . The residuals ( $\varepsilon_{it}$ ) are measured annually for each two-digit Standard Industry Code. The sum of the residuals of equation 2.1, 2.2, and 2.3 is represented in  $REM_{it}$  in the other equations.

### 3.1.2. The Inflation Rate and the Unemployment Rate on Earnings Management

This paper uses the models shown in equation 3.1 and 3.2 to investigate the relation between the inflation rate and earnings management (hypothesis 1). To examine the relation

between the unemployment rate and earnings management (hypothesis 2) the models shown in equations 4.1 and 4.2 are used.

$$\begin{aligned} \text{Discretionary accruals}_{it} = & \mu_0 + \mu_1 \text{inflation rate}_{it} + \mu_2 \text{inflation rate}_{it-1} + \mu_3 \text{inflation rate}_{it-2} + \\ & \mu_4 MVE_{it} + \mu_5 MTBRatio_{it-1} + \mu_6 Leverage_{it-1} + \mu_7 ROA_{it} + \mu_8 TA\_growth_{it} + \mu_9 Size_{it-1} + \\ & \mu_{10} Employment\_growth_{it} + \varepsilon_{it} \end{aligned} \quad (3.1)$$

$$\begin{aligned} REM_{it} = & \mu_0 + \mu_1 \text{inflation rate}_{it} + \mu_2 \text{inflation rate}_{it-1} + \mu_3 \text{inflation rate}_{it-2} + \mu_4 MVE_{it} + \\ & \mu_5 MTBRatio_{it-1} + \mu_6 Leverage_{it-1} + \mu_7 ROA_{it} + \mu_8 TA\_growth_{it} + \mu_9 Size_{it-1} + \\ & \mu_{10} Employment\_growth_{it} + \varepsilon_{it} \end{aligned} \quad (3.2)$$

$$\begin{aligned} \text{Discretionary accruals}_{it} = & \mu_0 + \mu_1 \text{unemployment rate}_{it} + \mu_2 \text{unemployment rate}_{it-1} + \\ & \mu_3 \text{unemployment rate}_{it-2} + \mu_4 MVE_{it} + \mu_5 MTBRatio_{it-1} + \mu_6 Leverage_{it-1} + \mu_7 ROA_{it} + \\ & \mu_8 TA\_growth_{it} + \mu_9 Size_{it-1} + \mu_{10} Employment\_growth_{it} + \varepsilon_{it} \end{aligned} \quad (4.1)$$

$$\begin{aligned} REM_{it} = & \mu_0 + \mu_1 \text{unemployment rate}_{it} + \mu_2 \text{unemployment rate}_{it-1} + \mu_3 \text{unemployment rate}_{it-2} + \\ & \mu_4 MVE_{it} + \mu_5 MTBRatio_{it-1} + \mu_6 Leverage_{it-1} + \mu_7 ROA_{it} + \mu_8 TA\_growth_{it} + \mu_9 Size_{it-1} + \\ & \mu_{10} Employment\_growth_{it} + \varepsilon_{it} \end{aligned} \quad (4.2)$$

*Discretionary accruals<sub>it</sub>* represents the discretionary accruals of company *i* in year *t*. The discretionary accruals are measured with the residuals ( $\varepsilon_{it}$ ) of equation 1. *REM<sub>it</sub>* contains the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs of company *i* in year *t*. *REM<sub>it</sub>* is measured with the sum of the residuals ( $\varepsilon_{it}$ ) of equations 2.1, 2.2, and 2.3. *Inflation<sub>it(t-1, t-2)</sub>* represents the inflation rate in year *t* (*t*-1, *t*-2). The inflation rate is estimated with the personal consumption expenditures. Measuring the inflation rate with the personal consumption expenditures is generally favored above measuring the inflation rate with the consumer price index by the Federal Open Market Committee (FOMC) and the Federal Reserve Board (Bullard 2013; Smialek and Casselman 2023). *Unemployment rate<sub>it(t-1, t-2)</sub>* represents the unemployment rate in year *t* (*t*-1, *t*-2). The inflation rate and the unemployment rate are measured on state level.

This research uses lagged variables of the inflation rate and the unemployment rate. A test is performed to investigate how many lagged variables should be added in the regression. This test regresses several regressions with different lagged variables, to find the optimal amount of lagged variables. The test shows that the optimal amount of lagged variables is 2. The lagged variables further than *t*-2 are not significant and are therefore not added in the regressions. However, to test whether the results differ when *t* is omitted from the regression and different amounts of lagged variables are added, an additional analysis is performed in section 4.2.1.

To determine the control variables, this research examined prior studies. The control variables used in this research are the market value of equity (*MVE<sub>it</sub>*), the market to book ratio (*MTBRatio<sub>it-1</sub>*), leverage (*Leverage<sub>it-1</sub>*), the return on assets (*ROA<sub>it</sub>*), the total assets growth (*TA\_growth<sub>it</sub>*), the size of the company (*Size<sub>it-1</sub>*), and the employment growth (*Employment\_growth<sub>it</sub>*) (Ashbaugh, LaFond, and Mayhew 2003; Bergstress and Philippon

2006; Roychowdhury 2006; Jelinek 2007; Gargouri, Shabou, and Francoeur 2010; Ali and Zhang 2015). The control variables are described in table A of appendix A.

Hypothesis 1 expects that the inflation rate has a positive relation with earnings management. Therefore,  $\mu_1$ ,  $\mu_2$ , and  $\mu_3$  of equation 3.1 are expected to be positive and significant and  $\mu_1$ ,  $\mu_2$ , and  $\mu_3$  of equation 3.2 are expected to be negative and significant. Hypothesis 2 suggests no relation between the unemployment rate and earnings management, therefore  $\mu_1$ ,  $\mu_2$ , and  $\mu_3$  of equation 4.1 and 4.2 are expected to be insignificant.

### 3.1.3. Monitoring

Monitoring is included as interaction term in the models to investigate hypotheses 3 and 4. Monitoring can be measured with internal monitoring and external monitoring (Chtourou, Bedard, and Courteau 2001; Chung et al. 2002; Marra et al. 2011). Due to the limited time of this study, this study only focusses on external monitoring. This study follows prior studies and measures external monitoring with analysts following and the percentage of institutional ownership. Studies show that a greater analysts following and a greater percentage of institutional ownership reduce earnings management (Bushee 1998; Rajgopal et al. 1999; Yu 2008). Equation 5.1, 5.2, 6.1, and 6.2 show the models with monitoring included as interaction term. *Monitoring<sub>it</sub>* captures either the average analysts following of company i in year t (*Analysts\_following<sub>it</sub>*) or the percentage of institutional ownership of company i in year t (*Institutional\_ownership<sub>it</sub>*).

$$\begin{aligned} \text{Discretionary accruals}_{it} = & \lambda_0 + \lambda_1 \text{inflation rate}_{it} + \lambda_2 \text{inflation rate}_{it-1} + \lambda_3 \text{inflation rate}_{it-2} + \\ & \lambda_4 \text{Monitoring}_{it} + \lambda_5 \text{inflation rate}_{it} \times \text{Monitoring}_{it} + \lambda_6 \text{inflation rate}_{it-1} \times \text{Monitoring}_{it} + \\ & \lambda_7 \text{inflation rate}_{it-2} \times \text{Monitoring}_{it} + \lambda_8 \text{MVE}_{it} + \lambda_9 \text{MTB Ratio}_{it-1} + \lambda_{10} \text{Leverage}_{it-1} + \lambda_{11} \text{ROA}_{it} + \lambda_{12} \text{TA\_growth}_{it} \\ & + \lambda_{13} \text{Size}_{it-1} + \lambda_{14} \text{Employment\_growth}_{it} + \varepsilon_{it} \end{aligned} \quad (5.1)$$

$$\begin{aligned} \text{REM}_{it} = & \lambda_0 + \lambda_1 \text{inflation rate}_{it} + \lambda_2 \text{inflation rate}_{it-1} + \lambda_3 \text{inflation rate}_{it-2} + \lambda_4 \text{Monitoring}_{it} + \\ & \lambda_5 \text{inflation rate}_{it} \times \text{Monitoring}_{it} + \lambda_6 \text{inflation rate}_{it-1} \times \text{Monitoring}_{it} + \\ & \lambda_7 \text{inflation rate}_{it-2} \times \text{Monitoring}_{it} + \lambda_8 \text{MVE}_{it} + \lambda_9 \text{MTB Ratio}_{it-1} + \lambda_{10} \text{Leverage}_{it-1} + \lambda_{11} \text{ROA}_{it} + \lambda_{12} \text{TA\_growth}_{it} + \\ & \lambda_{13} \text{Size}_{it-1} + \lambda_{14} \text{Employment\_growth}_{it} + \varepsilon_{it} \end{aligned} \quad (5.2)$$

$$\begin{aligned} \text{Discretionary accruals}_{it} = & \lambda_0 + \lambda_1 \text{unemployment rate}_{it} + \lambda_2 \text{unemployment rate}_{it-1} + \\ & \lambda_3 \text{unemployment rate}_{it-1} + \lambda_4 \text{Monitoring}_{it} + \lambda_5 \text{unemployment rate}_{it} \times \text{Monitoring}_{it} + \\ & \lambda_6 \text{unemployment rate}_{it-1} \times \text{Monitoring}_{it} + \lambda_7 \text{unemployment rate}_{it-2} \times \text{Monitoring}_{it} + \lambda_8 \text{MVE}_{it} + \\ & \lambda_9 \text{MTB Ratio}_{it-1} + \lambda_{10} \text{Leverage}_{it-1} + \lambda_{11} \text{ROA}_{it} + \lambda_{12} \text{TA\_growth}_{it} + \lambda_{13} \text{Size}_{it-1} + \\ & \lambda_{14} \text{Employment\_growth}_{it} + \varepsilon_{it} \end{aligned} \quad (6.1)$$

$$\begin{aligned} \text{REM}_{it} = & \lambda_0 + \lambda_1 \text{unemployment rate}_{it} + \lambda_2 \text{unemployment rate}_{it-1} + \lambda_3 \text{unemployment rate}_{it-1} + \\ & \lambda_4 \text{Monitoring}_{it} + \lambda_5 \text{unemployment rate}_{it} \times \text{Monitoring}_{it} + \lambda_6 \text{unemployment rate}_{it-1} \times \text{Monitoring}_{it} + \\ & \lambda_7 \text{unemployment rate}_{it-2} \times \text{Monitoring}_{it} + \lambda_8 \text{MVE}_{it} + \lambda_9 \text{MTB Ratio}_{it-1} + \lambda_{10} \text{Leverage}_{it-1} + \lambda_{11} \text{ROA}_{it} \\ & + \lambda_{12} \text{TA\_growth}_{it} + \lambda_{13} \text{Size}_{it-1} + \lambda_{14} \text{Employment\_growth}_{it} + \varepsilon_{it} \end{aligned} \quad (6.2)$$

Hypotheses 3 and 4 suggest that the relation of, respectively, the inflation rate and earnings management or the unemployment rate and earnings management is smaller in companies with stronger monitoring. Therefore,  $\lambda_5$ ,  $\lambda_6$ , and  $\lambda_7$  of equation 5.1, 5.2, 6.1, and 6.2

are expected to have the opposite relation with earnings management compared to  $\lambda_1$ ,  $\lambda_2$ , and  $\lambda_3$  of the same equation.

### 3.2. Data

This study obtains data on the inflation rate and the unemployment rate from the Federal Reserve Bank of Saint Louis. Financial statement data is obtained from Compustat. Furthermore, this research obtains institutional ownership data from Thomson Reuters 13f file and analysts following data from IBES.

The sample of this study consists of publicly traded firms in the United States for the period of 2010-2021. As mentioned, several studies investigated the effect of the financial crisis on earnings management (Habib 2013; Filip and Raffournier 2014; Cimini 2015; Dimitras et al. 2015). This effect can be (partly) due to macroeconomic factors, however during the financial crisis a lot of other factors changed significantly as well (Rudd 2009; Adrian and Shin 2010; Stock and Watson 2010; Ball and Mazumder 2011). This makes it harder to determine the effect of the macroeconomic factors. Therefore, this study measures the relations between macroeconomic factors and earnings management after the 2007-2008 financial crisis. Financial services companies (SIC code between 6000-6999), utility companies (SIC code between 4900-4999), and companies with total sales less than 10 million US dollar are removed from the sample (Nallareddy, Sethuraman, and Venkatachalam 2020; Krieger, Mauck, and Pruitt 2021; Ball and Nikolaev 2022). To mitigate the effects of outliers, the continuous variables are winsorized at the 1 and 99 percent levels. The remaining sample consists of 6,830 firm year observations, representing 1,305 firms. Table B of appendix B shows the process of obtaining this amount of observations. The observations that remain are observations of firms and firm years that are found in all the datasets. This study chooses to include only firms that are represented in all the datasets because there is a probability that firms that are not present in, for example, the analysts following dataset do have analysts following them. If the variable of the average analysts following of these firms is set to zero, the results might be biased.

## 4. Results

This section summarizes the descriptive statistics. This section further describes the results of the regressions of the inflation rate on accrual and real earnings management and the regressions of the unemployment rate on accrual and real earnings management. The results of the regressions with monitoring included as interaction term are described as well.

### 4.1. Descriptive Statistics

The descriptive statistics of the variables used in the regressions are summarized in table 1. As mentioned in section 3.2, the descriptive statistics are obtained of 6,830 observations, representing 1,305 publicly traded firms with total sales of more than 10 million US dollar. The variables are winsorized at the 1 and 99 percent levels to mitigate outliers.

The inflation rate and the unemployment rate are shown as ratio. Table 1 shows that the mean of the inflation rate (the unemployment rate) in the sample at  $t$  is 4.23 (5.92) percent. Institutional ownership is measured as a percentage, the mean of institutional ownership in the sample is 0.7573 percent. The mean of the average analysts that follow firm  $i$  at  $t$  is 10.228. The descriptive statistics of the control variables are relatively similar to previous studies (Ali and Zhang 2015).



**Table 1 – Summary Statistics**

	Mean	Standard deviation	Median	Q1	Q3
<i>Discretionary accruals</i> <sub>it</sub>	0.0000	0.0889	0.0070	(0.0256)	0.0309
<i>REM</i> <sub>it</sub>	0.0000	0.3424	0.0181	(0.1489)	0.1629
<i>Inflation rate</i> <sub>it</sub>	0.0423	0.0412	0.0374	0.0263	0.0501
<i>Inflation rate</i> <sub>it-1</sub>	0.0304	0.0241	0.0361	0.0261	0.0454
<i>Inflation rate</i> <sub>it-2</sub>	0.0385	0.0122	0.0383	0.0314	0.0463
<i>Unemployment rate</i> <sub>it</sub>	0.0592	0.0202	0.0550	0.0420	0.0730
<i>Unemployment rate</i> <sub>it-1</sub>	0.0615	0.0231	0.0560	0.0420	0.0780
<i>Unemployment rate</i> <sub>it-2</sub>	0.0603	0.0242	0.0520	0.0410	0.0780
<i>Analysts_following</i> <sub>it</sub>	10.228	7.9807	7.9170	3.7500	15.417
<i>Institutional_ownership</i> <sub>it</sub>	0.7573	0.3438	0.8297	0.6472	0.9338
<i>ACC</i> <sub>it</sub>	(0.0412)	0.0972	(0.0377)	(0.0731)	(0.0083)
<i>A</i> <sub>it</sub>	8,719.9	21,351	1,825.2	514.67	5,848.9
<i>A</i> <sub>it-1</sub>	9,287.4	22,524	2,007.9	578.74	6,462.5
<i>A</i> <sub>it-2</sub>	9,339.1	29,296	1,682.1	467.50	5,463.7
<i>Discretionary Expenses</i> <sub>it</sub>	0.0659	0.0992	0.0318	0.0123	0.0794
<i>CFO</i> <sub>it</sub>	0.0790	0.1535	0.0951	0.0480	0.1419
<i>CFO</i> <sub>it-1</sub>	0.0787	0.1541	0.0946	0.0478	0.1424
<i>CFO</i> <sub>it+1</sub>	0.0759	0.1474	0.0908	0.0419	0.1378
<i>PROD</i> <sub>it</sub>	0.5234	0.4902	0.4041	0.1837	0.7162
<i>S</i> <sub>it-1</sub>	1.0194	0.6357	0.8676	0.6013	1.2886
$\Delta S$ <sub>it</sub>	(0.0641)	0.2560	(0.0434)	(0.1257)	0.0179
<i>PPE</i> <sub>it-1</sub>	0.4668	0.3448	0.3684	0.2140	0.6473
<i>MVE</i> <sub>it</sub>	7.7600	1.9990	7.7740	6.4730	9.1270
<i>MTBRatio</i> <sub>it-1</sub>	(428.25)	10,875	167.13	50.521	655.61
<i>Leverage</i> <sub>it-1</sub>	0.3005	0.2377	0.2724	0.1464	0.3991
<i>ROA</i> <sub>it</sub>	0.0246	0.1663	0.0495	(0.0003)	0.0921
<i>TA_growth</i> <sub>it</sub>	0.1281	0.3925	0.0545	(0.0183)	0.1544
<i>Size</i> <sub>it-1</sub>	7.4760	1.8724	7.5090	6.2440	8.6740
<i>Employment_growth</i> <sub>it</sub>	0.0619	0.2892	0.0314	(0.0313)	0.1000

Note. Table 1 shows the mean, standard deviation, median, the first quartile, and third quartile of the variables used in the regressions. A negative variable is presented in brackets.

The discretionary accruals are measured by the residuals of regression 1. The abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs are measured, respectively, by the residuals of regressions 2.1, 2.2, and 2.3. The independent variables are all significant on a 1 percent significance level in these regressions.

#### **4.2. The Inflation Rate, the Unemployment Rate, and Earnings Management**

To examine the relation between the inflation rate or the unemployment rate and earnings management, regressions 3.1, 3.2, 4.1, and 4.2 are performed. Table 2 shows the results. The regressions of the macroeconomic factors on the discretionary accruals are shown in panel A and the regressions of the macroeconomic factors on the sum of the abnormal

discretionary expenses, the abnormal operating cash flow, and the abnormal production costs are shown in panel B.  $MF_{it(t-1, t-2)}$  represents either the inflation rate or the unemployment rate. The regressions of the inflation rate on earnings management are shown in Column 1 of panel A and B and the regressions of the unemployment rate on the earnings management are shown in column 2 of panel A and B.

Column 1 of panel A shows the results of the regression of the inflation rate on the discretionary accruals (equation 3.1). The coefficient of the inflation rate at  $t$  is 0.0851 and significant on a 1 percent significance level. This suggests that a 1 percent increase in the inflation rate at  $t$  results in an increase of 0.0009 in the discretionary accruals. The coefficient of the inflation rate at  $t-1$  is -0.1175 and significant at a 5 percent significance level. The coefficient of the inflation rate at  $t-2$  is insignificant. All control variables are significant on at least a 5 percent significance level. The adjusted  $r$ -squared of the regression is 0.3184. The results of this regression suggest that a higher inflation rate at  $t$  leads to higher discretionary accruals at  $t$  and a higher inflation rate at  $t-1$  leads to lower discretionary accruals at  $t$ .

Column 2 of panel A shows the regression of the unemployment rate on the discretionary accruals (equation 4.1). The coefficient of the unemployment rate at  $t$  is insignificant. The coefficient of the unemployment rate at  $t-1$  is 0.3137 and significant on a 1 percent significance level. The coefficient of the unemployment rate at  $t-2$  is -0.2478 and significant on a 1 percent significance level. In this regression, all control variables are significant on at least a 5 percent significance level. The adjusted  $r$ -squared is 0.3180. The results suggest that a higher unemployment rate at  $t-1$  leads to higher discretionary accruals at  $t$  and a higher unemployment rate at  $t-2$  lead to lower discretionary accruals at  $t$ .

Column 1 of panel B shows the results of the regression of the inflation rate on the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs (equation 3.2). The coefficient of the inflation rate at  $t$  is 0.3673 and significant on a 1 percent significance level. The coefficients of the inflation rate at  $t-1$  and  $t-2$  are insignificant. All control variables, except the market value of equity, are significant on at least a 10 percent significance level. The adjusted  $r$ -squared is 0.2053. The results suggest that a higher inflation rate at  $t$  results in a higher sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs at  $t$ .

Column 2 of panel B shows the results of the regression of the unemployment rate on the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs (equation 4.2). The coefficients of the unemployment rate at  $t$  and  $t-2$  are, respectively, 0.4705 and 0.6485. These coefficients are significant on at least a 5 percent significance level. The coefficient of the unemployment rate at  $t-1$  is -0.7241 and significant on a 1 percent significance level. All control variables, except the market value of equity are significant on at least a 10 percent significance level. The adjusted  $r$ -squared is 0.2053. The results suggest that a higher unemployment rate at  $t$  and a higher unemployment rate at  $t-2$  result in a higher sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs at  $t$  and a higher unemployment rate at  $t-1$  results in a lower sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs at  $t$ .

The results in table 2 suggest that an increase in the inflation rate at  $t$  leads to an increase in the discretionary accruals at  $t$  and an increase in the inflation rate at  $t-1$  leads to a decrease in

**Table 2 – Relation between the Inflation Rate and the Unemployment Rate and Earnings Management**

Panel A: Dependent variable = <i>Discretionary Accruals<sub>it</sub></i>				
	Inflation rate		Unemployment rate	
	(1)		(2)	
	Coefficient	t-Statistic	Coefficient	t-Statistic
<i>Intercept</i>	0.0338***	6.290	0.0315***	6.233
<i>MF<sub>it</sub></i>	0.0851***	3.047	(0.0793)	(1.520)
<i>MF<sub>it-1</sub></i>	(0.1175)**	(2.047)	0.3137***	5.943
<i>MF<sub>it-2</sub></i>	(0.0744)	(0.973)	(0.2478)***	(4.922)
<i>MVE<sub>it</sub></i>	(0.0113)***	(10.74)	(0.0114)***	(10.858)
<i>MTBRatio<sub>it-1</sub></i>	0.0000**	2.288	0.0000**	2.286
<i>Leverage<sub>it-1</sub></i>	0.0402***	10.44	0.0395***	10.19
<i>ROA<sub>it</sub></i>	0.3177***	54.30	0.3191***	54.52
<i>TA<sub>growth</sub><sub>it</sub></i>	0.0203***	6.691	0.0196***	6.432
<i>Size<sub>it-1</sub></i>	0.0048***	4.274	0.0049***	4.358
<i>Employment<sub>growth</sub><sub>it</sub></i>	(0.0274)***	(6.853)	(0.0266)***	(6.644)
Adj. R <sup>2</sup>	0.3184		0.3180	
Number of observations	6,830		6,830	
Panel B: Dependent variable = <i>REM<sub>it</sub></i>				
	Inflation Rate		Unemployment Rate	
	(1)		(2)	
	Coefficient	t-Statistic	Coefficient	t-Statistic
<i>Intercept</i>	0.6194***	27.77	0.5897***	28.08
<i>MF<sub>it</sub></i>	0.3673***	3.163	0.4705**	2.170
<i>MF<sub>it-1</sub></i>	0.0060	0.030	(0.7241)***	(3.301)
<i>MF<sub>it-2</sub></i>	0.2719	0.856	0.6485***	3.100
<i>MVE<sub>it</sub></i>	0.0050	1.142	0.0056	1.293
<i>MTBRatio<sub>it-1</sub></i>	0.0000***	3.604	0.0000***	3.614
<i>Leverage<sub>it-1</sub></i>	0.0562***	3.510	0.0610***	3.786
<i>ROA<sub>it</sub></i>	0.4995***	20.54	0.4948***	20.34
<i>TA<sub>growth</sub><sub>it</sub></i>	(0.0244)*	(1.933)	(0.0219)*	(1.732)
<i>Size<sub>it-1</sub></i>	(0.0914)***	(19.61)	(0.0919)***	(19.77)
<i>Employment<sub>growth</sub><sub>it</sub></i>	0.0672***	4.044	0.0633***	3.808
Adj. R <sup>2</sup>	0.2053		0.2053	
Number of observations	6,830		6,830	

Note. Table 2 presents the results of the tests of the relations between the inflation rate (1) and the unemployment rate (2) and earnings management.  $MF_{it(t-1,t-2)}$  captures the macroeconomic factor that is being tested, thus it captures either the inflation rate or the unemployment rate. In column 1  $MF$  presents the inflation rate and in column 2  $MF$  captures the unemployment rate. In panel A accrual earnings management is measured with the discretionary accruals (the residuals of equation 1). In panel B real earnings management is measured with the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs (the sum of the residuals of equation 2.1, 2.2, and 2.3). The control variables are described in table A in appendix A. The continuous variables are winsorized at the 1 and 99 percent levels. A negative variable is presented in brackets. \* implies  $p < 0.10$ , \*\* implies  $p < 0.05$ , and \*\*\* implies  $p < 0.01$ .

the discretionary accruals at  $t$ . An increase in the unemployment rate at  $t-1$  results in an increase in the discretionary accruals at  $t$ , but an increase in the unemployment rate at  $t-2$  results in a decrease in the discretionary accruals at  $t$ . The contradictory relation between both the inflation rate and the unemployment rate and the discretionary accruals over the years might be because the discretionary accruals reverse over time (Guay, Kothari, and Watts 1996; Baber, Kang, and Li 2011).

Hypothesis 1 expects a positive relation between the inflation rate and earnings management. The findings of panel A and B are not in line with the hypothesis. The coefficient of the inflation rate at  $t$  in panel A is positive, this suggests a positive relation between the inflation rate and the discretionary accruals. However, the inflation rate at  $t-1$  has a significantly larger negative relation relative to the positive relation of the inflation rate at  $t$  (see table C of appendix C). Therefore, the results of regression 3.1 suggest a negative relation between the inflation rate and accrual earnings management. The positive coefficient of the inflation rate at  $t$  in panel B suggests that the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs at  $t$  is higher when the inflation rate at  $t$  is higher. The results of panel B suggest a negative relation between the inflation rate and real earnings management. The results of panel A and B suggest that the inflation rate and earnings management have a negative relation. This is not in line with hypothesis 1. An explanation for the positive relation between the inflation rate at  $t$  and the discretionary accruals at  $t$  and the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs at  $t$ , is that the increase in the prices might be reflected in the discretionary accruals, the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs. It is possible that the effect of the price rise is incorporated more in the discretionary accruals, the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs relative to the effect of earnings management.

Hypothesis 2 expects no relation between the unemployment rate and earnings management. The results of panel A in table 2 suggest no relation between the unemployment rate and accrual earnings management. The positive relation between the unemployment rate at  $t-1$  and the discretionary accruals offsets the negative relation between the unemployment rate at  $t-2$  and the discretionary accruals (see table C of appendix C). The results of panel A therefore show no overall relation between the unemployment rate and the discretionary accruals. Panel B of table 2 also suggest no relation between the unemployment rate and real earnings

management, because the positive coefficients of the unemployment rate on  $t$  and  $t-2$  are offset by the negative coefficient of the unemployment rate on  $t-1$  (see table C of appendix C). The results of column 2 in panel A and B are in line with hypothesis 2.

#### ***4.2.1. Additional Analysis of the Inflation Rate, the Unemployment Rate, and Earnings Management***

Table D in appendix D shows the results of the regressions of the macroeconomic factors on earnings management when regressing the equations (equations 3.1, 3.2, 4.1, and 4.2) with different lags of the macroeconomic factors. These regressions are performed because the results might differ when  $t$  is omitted from the regressions, different lags are omitted from the regressions, or different lags are added to the regressions. Besides that, the results of 4.2 show that several lags of the macroeconomic factors have opposite coefficients. To examine whether the found results stay relatively similar when different lags are regressed, several regressions with different lags are performed.

The results of table D in appendix D show relatively similar results compared to the results of table 2. Panel A shows a negative relation between the inflation rate and the discretionary accruals in all three columns and panel C shows a positive relation between the inflation rate and the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs (see table C of appendix C for column 2 of panel A). Panel B shows no relation between the unemployment rate and the discretionary accruals (see table C of appendix C for column 1 and 3 of panel B). Column 1 of panel D shows a negative relation between the unemployment rate and the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs. However, column 2 and 3 of panel D show no relation between the unemployment rate and the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs (see table C of appendix C for column 3 of panel D).

#### **4.3. Macroeconomic Factors, Monitoring, and Earnings Management**

The relations between the inflation rate and earnings management and the unemployment rate and earnings management might be affected by monitoring. To investigate whether monitoring affects these relations, monitoring is included in the regression as interaction term. Monitoring is measured with either the average amount of analysts that follow firm  $i$  at  $t$  or the percentage of institutional ownership of firm  $i$  at  $t$ . Table 3 shows the results of the regressions of the specific macroeconomic factors on earnings management with monitoring as interaction term. Panel A and B show the regressions with the discretionary accruals as dependent variable and panel C and D show the regressions with the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs as dependent variable. In panel A and C monitoring is measured with analysts following and in panel B and D monitoring is measured with the institutional ownership.

If the coefficient of the interaction term at  $t$  ( $t-1$ ,  $t-2$ ) has the opposite sign compared to the sign of the coefficient of the macroeconomic factor at  $t$  ( $t-1$ ,  $t-2$ ), the results suggest that monitoring is expected to mitigate the relation between the inflation rate and earnings management and/or the relation between the unemployment rate and earnings management. This paper focusses on the interaction terms when the macroeconomic factor is significant.

The results of column 1 of panel A in table 3 show that the interaction term is insignificant when testing the regression of the inflation rate on the discretionary accruals with

**Table 3 – Relation between the Inflation Rate or the Unemployment Rate, Monitoring, and Earnings Management**

Panel A: Dependent variable = *Discretionary Accruals<sub>it</sub>*, monitoring variables = *Analysts\_following<sub>it</sub>*

	Inflation rate		Unemployment rate	
	(1)		(2)	
	Coefficient	t-Statistic	Coefficient	t-Statistic
<i>Intercept</i>	0.0219***	2.904	0.0171**	2.508
<i>MF<sub>it</sub></i>	0.0997**	2.250	0.0338	0.406
<i>MF<sub>it-1</sub></i>	(0.1607)**	(2.069)	0.3871***	4.529
<i>MF<sub>it-2</sub></i>	(0.0209)	(0.173)	(0.3708)***	(4.582)
<i>Analysts_following<sub>it</sub></i>	(0.0006)	(1.257)	(0.0005)	(1.095)
<i>MF<sub>it</sub></i>	(0.0010)	(0.285)	(0.0116)*	(1.742)
<i>x</i>				
<i>Analysts_following<sub>it</sub></i>				
<i>MF<sub>it-1</sub></i>	0.0064	1.054	(0.0076)	(1.103)
<i>x</i>				
<i>Analysts_following<sub>it</sub></i>				
<i>MF<sub>it-2</sub></i>	(0.0059)	(0.651)	0.0150**	2.398
<i>x</i>				
<i>Analysts_following<sub>it</sub></i>				
<i>MVE<sub>it</sub></i>	(0.0094)***	(8.039)	(0.0094)***	(8.090)
<i>MTBRatio<sub>it-1</sub></i>	0.0000**	2.271	0.0000**	2.261
<i>Leverage<sub>it-1</sub></i>	0.0402***	10.45	0.0399***	10.28
<i>ROA<sub>it</sub></i>	0.3155***	53.63	0.3174***	53.87
<i>TA_growth<sub>it</sub></i>	0.0196***	6.453	0.0187***	6.139
<i>Size<sub>it-1</sub></i>	0.0052***	4.588	0.0052***	4.649
<i>Employment_growth<sub>it</sub></i>	(0.0274)***	(6.837)	(0.0263)***	(6.577)
Adj. R <sup>2</sup>	0.3197		0.3197	
Number of observations	6,830		6,830	

Panel B: Dependent variable = *Discretionary Accruals<sub>it</sub>*, monitoring variables = *Institutional\_ownership<sub>it</sub>*

	Inflation Rate		Unemployment Rate	
	(1)		(2)	
	Coefficient	t-Statistic	Coefficient	t-Statistic
<i>Intercept</i>	0.0535***	5.437	0.0466***	5.741
<i>MF<sub>it</sub></i>	(0.0680)	(1.013)	0.2977**	2.471
<i>MF<sub>it-1</sub></i>	(0.4731)***	(4.335)	0.2412**	2.029
<i>MF<sub>it-2</sub></i>	0.0633	0.343	(0.6788)***	(5.758)
<i>Institutional_ownership<sub>it</sub></i>	(0.0334)***	(2.919)	(0.0254)***	(2.982)
<i>MF<sub>it</sub></i>	0.1999**	2.461	(0.5056)***	(3.497)
<i>x</i>				
<i>Institutional_ownership<sub>it</sub></i>				
<i>MF<sub>it-1</sub></i>	0.4654***	3.593	0.0958	0.674
<i>x</i>				
<i>Institutional_ownership<sub>it</sub></i>				
<i>MF<sub>it-2</sub></i>	(0.1816)	(0.796)	0.5701***	3.950
<i>x</i>				
<i>Institutional_ownership<sub>it</sub></i>				
<i>MVE<sub>it</sub></i>	(0.0106)***	(10.03)	(0.0109)***	(10.383)
<i>MTBRatio<sub>it-1</sub></i>	0.0000**	2.203	0.0000**	2.148
<i>Leverage<sub>it-1</sub></i>	0.0397***	10.35	0.0391***	10.12
<i>ROA<sub>it</sub></i>	0.3205***	54.84	0.3216***	55.04
<i>TA_growth<sub>it</sub></i>	0.0187***	6.155	0.0181***	5.963
<i>Size<sub>it-1</sub></i>	0.0048***	4.325	0.0051***	4.531
<i>Employment_growth<sub>it</sub></i>	(0.0262)***	(6.563)	(0.0259)***	(6.500)
Adj. R <sup>2</sup>	0.3232		0.3241	
Number of observations	6,830		6,830	

Panel C: Dependent variable = $REM_{it}$ , monitoring variables = $Analysts\_following_{it}$				
	Inflation Rate		Unemployment Rate	
	(1)		(2)	
	Coefficient	t-Statistic	Coefficient	t-Statistic
<i>Intercept</i>	0.5886***	18.95	0.4720***	16.76
$MF_{it}$	(0.4964)***	(2.721)	(0.3829)	(1.116)
$MF_{it-1}$	0.5281*	1.652	(0.1128)***	(3.203)
$MF_{it-2}$	(0.2203)***	(4.448)	0.1771***	5.309
<i>Analysts_following<sub>it</sub></i>	(0.0170)***	(8.366)	(0.0105)***	(6.152)
$MF_{it}$	0.0217	1.443	0.0832***	3.027
<i>x</i>				
<i>Analysts_following<sub>it</sub></i>				
$MF_{it-1}$	(0.0223)	(0.891)	0.0355	1.243
<i>x</i>				
<i>Analysts_following<sub>it</sub></i>				
$MF_{it-2}$	0.2318***	6.204	(0.0780)***	(3.016)
<i>x</i>				
<i>Analysts_following<sub>it</sub></i>				
$MVE_{it}$	0.0273***	5.695	0.0282***	5.884
$MTBRatio_{it-1}$	0.0000***	3.740	0.0000***	3.673
$Leverage_{it-1}$	0.0564***	3.562	0.0621***	3.888
$ROA_{it}$	0.4686***	19.35	0.4605***	18.96
$TA\_growth_{it}$	(0.0274)**	(2.192)	(0.0230)*	(1.829)
$Size_{it-1}$	(0.0882)***	(19.04)	(0.0873)***	(18.88)
$Employment\_growth_{it}$	0.0640***	3.887	0.0577***	3.499
Adj. R <sup>2</sup>	0.2221		0.2205	
Number of observations	6,830		6,830	



Panel D: Dependent variable = $REM_{it}$ , monitoring variables = $Institutional\_ownership_{it}$				
	Inflation Rate		Unemployment Rate	
	(1)		(2)	
	Coefficient	t-Statistic	Coefficient	t-Statistic
<i>Intercept</i>	0.5367***	13.10	0.5446***	16.10
$MF_{it}$	0.1348	0.482	0.3344	0.666
$MF_{it-1}$	1.2270***	2.701	(0.8100)	(1.635)
$MF_{it-2}$	0.2207	0.287	0.1205**	2.454
$Institutional\_ownership_{it}$	0.1347***	2.826	0.0782**	2.199
$MF_{it}$	(0.6558)*	(1.939)	0.2054	0.341
<i>x</i>				
$Institutional\_ownership_{it}$				
$MF_{it-1}$	(1.5970)***	(2.963)	0.1359	0.230
<i>x</i>				
$Institutional\_ownership_{it}$				
$MF_{it-2}$	0.0505	0.053	(0.0709)*	(1.719)
<i>x</i>				
$Institutional\_ownership_{it}$				
$MVE_{it}$	0.0025	0.566	0.0039	0.880
$MTBRatio_{it-1}$	0.0000***	3.686	0.0000***	3.733
$Leverage_{it-1}$	0.0578***	3.614	0.0611***	3.794
$ROA_{it}$	0.4902***	20.15	0.4869***	20.00
$TA\_growth_{it}$	(0.0191)	(1.513)	(0.0182)	(1.437)
$Size_{it-1}$	(0.0915)***	(19.64)	(0.0925)***	(19.87)
$Employment\_growth_{it}$	0.0634***	3.810	0.0621***	3.739
Adj. R <sup>2</sup>	0.2089		0.2083	
Number of observations	6,830		6,830	

Note. Table 3 presents the results of the tests of the relations between the inflation rate (1) and the unemployment rate (2) and earnings management.  $MF_{t(t-1,t-2)}$  captures the macroeconomic factor that is being tested, thus it captures either the inflation rate or the unemployment rate. In column 1  $MF$  presents the inflation rate and in column 2  $MF$  captures the unemployment rate. In panel A and B accrual earnings management is measured with the discretionary accruals (the residuals of equation 1). In panel C and D real earnings management is measured with the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs (the sum of the residuals of equation 2.1, 2.2, and 2.3). In panel A and C monitoring is measured with the average analysts following and in panel B and D monitoring is measured with the percentage of institutional ownership. The control variables are described in table A in appendix A. The continues variables are winsorized at the 1 and 99 percent levels. A negative variable is presented in brackets. \* implies  $p < 0.10$ , \*\* implies  $p < 0.05$ , and \*\*\* implies  $p < 0.01$

analysts following as variable to measure monitoring (equation 5.1). These results might be because different factors can have an influence on the relation between the amount of analysts following a firm and earnings management. As mentioned in section 3.1.3, analysts can be seen as external monitors for earnings management. However, it is possible that a greater amount of analysts following a firm results in a greater pressure on managers to manage earnings. Yu (2008) explains that a greater amount of analysts following a manager regularly results in a greater pressure on managers to perform. This pressure might result in managers engaging in earnings management. It is possible that due to the contradictory influences of analysts following a firm, the interaction term of analysts following is insignificant.

Column 1 of panel B in table 3 shows the results of the regression of equation 5.1 with the percentage of institutional ownership as monitoring variable. The results show that the coefficient of the inflation rate at t-1 is -0.4731 and significant on a 1 percent significance level. The coefficients of the inflation rate at t and t-2 are insignificant. The coefficient of the interaction term of the inflation rate at t-1 and the percentage of institutional ownership at t is 0.4654 and significant on a 1 percent significance level. The results show that the interaction term has the opposite relation with the discretionary accruals compared to the relation of the inflation rate at t-1, therefore the results suggest that the percentage of institutional ownership mitigates the relation between the inflation rate at t-1 and accrual earnings management.

The results of column 2 of panel A in table 3 show the regression with the unemployment rate as the macroeconomic factor and the average analysts following as monitoring variable (equation 6.1). The results show that the coefficient of the unemployment rate at t is insignificant. The coefficients of the unemployment rate at t-1 and t-2 are significant on a 1 percent significance level. They are, respectively, 0.3871 and -0.3708. The coefficient of the interaction term of the unemployment rate at t-2 and the average analysts following is 0.0150 and significant on a 5 percent significance level. This interaction term has the opposite relation with the discretionary accruals compared to the relation of the unemployment rate at t-2 with the discretionary accruals. This suggests that the amount of analysts following a firm mitigates the relation between the unemployment rate at t-2 and accrual earnings management.

Column 2 of panel B shows the results of the regression of the unemployment rate on the discretionary accruals with the percentage of institutional ownership as monitoring variable (equation 6.1). The coefficients of the unemployment rate at t, t-1, and t-2 are, respectively, 0.2977, 0.2412, and -0.6788 and significant on at least a 5 percent significance level. The coefficients of the interaction terms of the unemployment rate at t and t-2 and the percentage of institutional ownership are significant on a 1 percent significance level and are, respectively, -0.5056 and 0.5701. These interaction terms have the opposite relations with the discretionary accruals compared to the relations of the unemployment rate at t and t-2 with the discretionary accruals. This suggests that the percentage of institutional ownership mitigates the relation between the unemployment rate at t and the unemployment rate at t-2 and accrual earnings management.

Column 1 of panel C shows the regression of the inflation rate on the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs with analysts following as monitoring variable (equation 5.2). The results show that the coefficients of the inflation rate at t and t-2 are negative (respectively, -0.4964 and -0.2203) and significant on a 1 percent significance level. The coefficient of the inflation

rate at t-1 is positive (0.5281) and significant on a 10 percent significance level. The coefficient of the interaction term of the inflation rate at t-2 and the average analysts following at t is significant and positive (0.2318), this coefficient has the opposite sign compared to the coefficient of the inflation rate at t-2. This suggests that the amount of analysts following a firm mitigates the relation between the inflation rate at t-2 and real earnings management at t.

Column 1 of panel D shows the results of regression 5.2 with the percentage of institutional ownership as monitoring variable. The results show a significant positive coefficient for the inflation rate at t-1 (1.2270) and a significant negative coefficient for the interaction term of the inflation rate at t-1 and the percentage of institutional ownership at t (-1.5970). The coefficient of this interaction term has the opposite sign compared to the sign of the coefficient of the inflation rate at t-1. The results therefore suggest that the percentage of institutional ownership mitigates the relation between the inflation rate at t-1 and real earnings management at t.

Column 2 of panel C shows the results of regression 6.2 with analysts following as monitoring variable. The results show that the coefficients of the unemployment rate at t-1 and t-2 are significant. The coefficients are, respectively, -0.1128 and 0.1771. The interaction term of the unemployment rate at t-2 and the average analysts following at t is -0.0780. The interaction term of the unemployment rate at t-2 and the average analysts following has the opposite relation with the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs compared to the unemployment rate at t-2. This suggests that the amount of analysts following a firm at t mitigates the relation between the unemployment rate at t-2 and real earnings management at t.

Column 2 of panel D shows the results of regression 6.2 with the percentage of institutional ownership as monitoring variable. The coefficient of the unemployment rate at t-2 is positive (0.1205) and significant on a 5 percent significance level. The interaction term of the unemployment rate at t-2 and the percentage of institutional ownership is -0.0709 and significant on a 10 percent significance level. The interaction term has the opposite relation with the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs compared to the unemployment rate at t-2. This suggests that the percentage of institutional ownership mitigates the relation between the unemployment rate at t-2 and real earnings management at t.

To summarize, the results suggest that the amount of analysts following a firm at t does not effect the relation between the inflation rate and accrual earnings management. These results are not in line with hypothesis 3. However, the results suggest that the amount of analysts following a firm at t mitigates the relation between the unemployment rate and accrual earnings management and the relation between both the inflation rate and the unemployment rate and real earnings management. These findings are in line with hypotheses 3 and 4.

The results suggest that the percentage of institutional ownership mitigates the relation between the inflation rate and both accrual and real earnings management. This is in line with hypothesis 3. The results also suggest that the percentage of institutional ownership mitigates the relation between the unemployment rate and both accrual and real earnings management. This is in line with hypothesis 4.

## 5. Conclusion

This research focussed on the relations between the inflation rate and earnings management and the unemployment rate and earnings management and how monitoring affects these relations. Due to the consequences of earnings management, it is important to investigate when earnings management increases. Several macroeconomic factors are the highest they have been in a long time (Winters 2022; Malinsky 2023; Swagerman 2023). If these factors influence earnings management it can have consequences for a lot of stakeholders. Therefore, this research tried to answer the following research question: *Do macroeconomic factors influence the amount of earnings management?*

This research focused on two macroeconomic factors: the inflation rate and the unemployment rate. The first two sub-questions were therefore: *Is there a relation between the inflation rate and earnings management?* and *Is there a relation between the unemployment rate and earnings management?*. This research also investigated how monitoring affects the relation between these macroeconomic factors and earnings management. The last sub-question was therefore formulated as follows: *Does monitoring affect the relations between the examined macroeconomic factors and earnings management?*

To answer the research question and sub-questions, hypotheses were formed. The hypotheses are based on findings of prior studies and the fraud triangle. The first hypothesis predicts a positive relation between the inflation rate and earnings management. The results show a significant positive relation between the inflation rate at  $t$  and the discretionary accruals at  $t$ , however the results also show a significantly larger negative relation between the inflation rate at  $t-1$  and the discretionary accruals at  $t$ . The reversal effect of discretionary accruals can (partly) explain the opposite signs of the lagged inflation rate variables. Additionally, the results indicate that the inflation rate at  $t$  has a positive relation with the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs. Therefore, the results suggest an overall negative relation between the inflation rate and both accrual and real earnings management. Due to these results, the first hypothesis is rejected. An explanation for these results is that the increase in the prices might be reflected in the discretionary accruals, the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs. This effect might be bigger or better reflected than the effect of earnings management.

The second hypothesis predicts no relation between the unemployment rate and earnings management. The results show a positive relation between the unemployment rate at  $t-1$  and the discretionary accruals at  $t$ . However, the results show a negative relation between the unemployment rate at  $t-2$  and the discretionary accruals at  $t$ . The positive relation and the negative relation do not significantly differ. This suggests no overall relation between the unemployment rate and accrual based earnings management. On the other hand, it is possible that the opposite relations of the lagged unemployment rates can be (partially) explained by the reversal effect of the discretionary accruals. Additionally, the results show that there is a positive relation between the unemployment rates at  $t$  and  $t-2$  and the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs. However, there is a negative relation between the unemployment rate at  $t-1$  and the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs. The positive and negative relations do not significantly differ. This suggests

no overall relation between the unemployment rate and real earnings management. Due to these results, hypothesis 2 cannot be rejected.

The third and fourth hypotheses focus on how monitoring influences the relations between the inflation rate and earnings management and the unemployment rate and earnings management. These hypotheses predict that the relations between the macroeconomic factors and earnings management are weaker in companies with stronger monitoring. Monitoring is measured by the amount of analysts following firm  $i$  at  $t$  and the percentage of institutional ownership of firm  $i$  at  $t$ . The results indicate that the amount of analysts following firm  $i$  mitigates the relation between the unemployment rate and accrual earnings management and the relation between both the inflation rate and the unemployment rate and real earnings management. The average analysts following does not appear to effect the relation between the inflation rate and accrual earnings management. The results show that the percentage of institutional ownership mitigates the relation between both the inflation rate and the unemployment rate and accrual earnings management and the relation between both the inflation rate and the unemployment rate and real earnings management. Therefore, the results suggest that overall the relations between the macroeconomic factors and accrual and real earnings management are weaker in companies with more analysts following them and in companies with a higher percentage of institutional ownership. Therefore, hypotheses 3 and 4 are not rejected.

### **5.1. Contribution to Prior Literature**

This study contributes to prior research because it investigated the relations between specific macroeconomic factors and earnings management. Just a few studies investigated these relations and when they investigated these relations they focused on the extreme cases of earnings management (i.e. fraud). These studies did not look at the discretionary accruals or the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs.

Prior research that examined the relation between inflation and fraud found a positive relation between inflation and fraud in Brazilian companies (Gava and Vitiello 2014). This research finds a negative relation between the inflation rate and both accrual and real earnings management. This study contributes to prior literature because this study finds that the relation between the inflation rate and earnings management might differ between different forms of earnings management, because it appears that the relation between the inflation rate and earnings management differs when earnings management is measured with either fraud, accrual earnings management, or real earnings management. Therefore, researchers and stakeholders should not assume that the found relation between inflation and fraud applies for the less extreme cases of earnings management as well.

Results of other studies suggest a positive relation between the unemployment rate and accounting fraud (Mustafa and Khan 2020; Omankhanlen et al. 2021). This study finds no overall relation between the unemployment rate and both accrual and real earnings management. Thus, this study contributes to prior literature because prior literature assumed a positive relation between the unemployment rate and earnings management when earnings management is measured with fraud, this study finds no relation between the unemployment rate and earnings management when measuring earnings management with less extreme forms of earnings management (i.e. accrual earnings management or real earnings management).

This study also contributes to the literature about the effect of financial crises on earnings management. Studies found that earnings management decreased during the financial crisis of 2007-2008 (Habib 2013; Filip and Raffournier 2014; Cimini 2015; Dimitras et al. 2015). This study contributes to the literature of financial crises, because it finds a negative relation between the inflation rate and earnings management. The inflation rate reduced significantly during the 2007-2008 financial crisis. Therefore it is possible that the effect of the change in other factors, during the financial crisis of 2007-2008, on earnings management is greater than expected (Stock and Watson 2010; Ball and Mazumder 2011). This study does not contribute to the literature of the financial crisis with the findings of the unemployment rate, because these findings cannot reject the hypothesis that there is no relation between the unemployment rate and earnings management.

This study complements prior studies that investigated the moderating effect of monitoring on variables that influence earnings management and earnings management (Rajgopal et al. 1999; Chung et al. 2002; Klein 2002; Yu 2008). The results show that the average amount of analysts following a firm and the percentage of institutional ownership mitigates the relation between the macroeconomic factors and earnings management.

The findings of this research have implications for stakeholders. Stakeholders can take the findings of this research into consideration when they try to detect earnings management, try to anticipate earnings management, and when determining the true economic value of a firm (Dechow et al. 2010). Stakeholders can also anticipate which sort of earnings management (i.e. fraud, accrual earnings management, or real earnings management) is more likely to occur in a specific macroeconomic environment. Additionally, stakeholders can take the mitigating effect of monitoring into account when analyzing companies.

Companies can try to improve their internal controls (Culp 2002). They can take the macroeconomic environment and the effect of this environment on earnings management into account when determining the internal controls. Auditors can also take the findings of this study into account in their processes and thereby increase the probability of finding intentional errors.

## **5.2. Limitations and Future Research**

This research measures earnings management with McNichols' (2002) model and Roychowdhury's (2006) cross-sectional models. These models are still used in recent studies (e.g. Darmawan et al. 2019; Zalata et al. 2019; Hsieh et al. 2020; Li et al. 2020; Lassoued and Khanchel 2021; Zaman et al. 2021). However, these models are from 2002 and 2006. Future research should examine newer models that measure earnings management and use these models to investigate the relations between macroeconomic factors and earnings management.

This research measures inflation with the personal consumption expenditures price index. The consumer price index is another method to measure inflation. Therefore, future research should examine whether the relation between inflation and earnings management differs when measuring inflation with the consumer price index.

A limitation of this research is that the results might be biased, because there might be omitted variables. Further, the companies in the sample had to appear in all three databases. This resulted in many companies being excluded from the sample. This could have resulted in a less representative sample. Future research should take these possible biases into account.

Future research should investigate the relations between macroeconomic factors and fraud for publicly traded companies in the United States. This research focusses on the less

extreme cases of earnings management. However, fraud has more severe consequences than these less extreme cases of earnings management. Previous studies found a different relation between the examined macroeconomic factors and an extreme form of earnings management (i.e. fraud) compared to the findings of this research on the relation between the macroeconomic factors and less extreme forms of earnings management (i.e. accrual and real earnings management) (Gava and Vitiello 2014; Mustafa and Khan 2020; Omankhanlen et al. 2021). Therefore, it is important to investigate whether the relation between the examined macroeconomic factors and fraud, for publicly traded companies in the United States, is similar to the relation between the examined macroeconomic factors and the less severe cases of earnings management or similar to the relation between the examined macroeconomic factors and fraud in Brazilian, Nigerian, and United Arab Emirates companies.

Future research should examine whether the magnitude of the inflation rate changes managers' behavior to engage in earnings management. As mentioned, Gava and Vitiello (2014) found different results compared to the results of this study. They compared low inflation periods to high inflation periods. This study could not use the 2022 year data, the inflation rate in 2022 was extremely high (Swagerman 2023). With the data of 2022, it would be interesting to investigate whether the results of high inflation periods and low inflation periods are more similar to the results of Gava and Vitiello (2014).

Another suggestion for future research is to broaden the examined years to obtain more observations. This research examines the relation between specific macroeconomic factors and earnings management from 2010 until 2021 and uses 6,830 observations. Expanding the research over time and thereby increasing the number of observations, will reduce other biases.

## 6. Bibliography

- Adrian, T., & Shin, H. S. (2010). The changing nature of financial intermediation and the financial crisis of 2007–2009. *Annu. Rev. Econ.*, 2(1), 603-618.
- Ali, A., & Zhang, W. (2015). CEO tenure and earnings management. *Journal of Accounting and Economics*, 59(1), 60-79.
- Ashbaugh, H., LaFond, R., & Mayhew, B. W. (2003). Do nonaudit services compromise auditor independence? Further evidence. *The Accounting Review*, 78(3), 611-639.
- Athanasakou, V. E., Strong, N. C., & Walker, M. (2009). Earnings management or forecast guidance to meet analyst expectations?. *Accounting and Business Research*, 39(1), 3-35.
- Baber, W. R., Kang, S. H., & Li, Y. (2011). Modeling discretionary accrual reversal and the balance sheet as an earnings management constraint. *The Accounting Review*, 86(4), 1189-1212.
- Ball, L. M., & Mazumder, S. (2011). Inflation dynamics and the great recession (No. w17044). *National Bureau of Economic Research*.
- Ball, R., & Nikolaev, V. V. (2022). On earnings and cash flows as predictors of future cash flows. *Journal of Accounting and Economics*, 73(1), 101430.
- Bergstresser, D., & Philippon, T. (2006). CEO incentives and earnings management. *Journal of Financial Economics*, 80(3), 511-529.
- Beyer, A., Guttman, I., & Marinovic, I. (2019). Earnings management and earnings quality: Theory and evidence. *The Accounting Review*, 94(4), 77-101.
- Bowen, R. M., DuCharme, L., & Shores, D. (1995). Stakeholders' implicit claims and accounting method choice. *Journal of Accounting and Economics*, 20(3), 255-295.
- Braam, G., Nandy, M., Weitzel, U., & Lodh, S. (2015). Accrual-based and real earnings management and political connections. *The International Journal of Accounting*, 50(2), 111-141.
- Brown, T. J. (2014). Advantageous comparison and rationalization of earnings management. *Journal of Accounting Research*, 52(4), 849-876.
- Bruno, M. (1993). Inflation and growth in an integrated approach (No. 4422). *National Bureau of Economic Research*.
- Bullard, J. (2013). President's Message: CPI vs. PCE Inflation: Choosing a Standard Measure. *Federal Reserve Bank of ST. Louis*. From: [stlouisfed.org/publications/regional-economist/july-2013/cpi-vs-pce-inflation--choosing-a-standard-measure](http://stlouisfed.org/publications/regional-economist/july-2013/cpi-vs-pce-inflation--choosing-a-standard-measure)
- Bushee, B. J. (1998). The influence of institutional investors on myopic R&D investment behavior. *The Accounting Review*, 305-333.
- Cambridge Dictionary. (n.d.). from [www.dictionary.cambridge.org](http://www.dictionary.cambridge.org)
- Chtourou, S., Bedard, J., & Courteau, L. (2001). Corporate governance and earnings management. *Social Science Research Network*.
- Chung, R., Firth, M., & Kim, J. B. (2002). Institutional monitoring and opportunistic earnings management. *Journal of Corporate Finance*, 8(1), 29-48.
- Cimini, R. (2015). How has the financial crisis affected earnings management? A European study. *Applied Economics*, 47(3), 302-317.
- Cohen, D. A., & Zarowin, P. (2010). Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics*, 50(1), 2-19.



- Cressey, D. R. (1950). The criminal violation of financial trust. *American Sociological Review*, 15(6), 738-743.
- Cressey, D. R. (1953). *Other people's money*. [https://openlibrary.org/books/OL5416032M/Other\\_people's\\_money](https://openlibrary.org/books/OL5416032M/Other_people's_money)
- Culp, C. L. (2002). *The Risk Management Process: Business Strategy and Tactics*. <http://ci.nii.ac.jp/ncid/BA5194116>
- Darmawan, I. P. E., Sutrisno, T., & Mardiaty, E. (2019). Accrual Earnings Management and Real Earnings Management: Increase or Destroy Firm Value?. *International Journal of Multicultural and Multireligious Understanding*, 6(2), 8-19.
- Davidson, R., Goodwin-Stewart, J., & Kent, P. (2005). Internal governance structures and earnings management. *Accounting & Finance*, 45(2), 241-267.
- Dechow, P. M., & Dichev, I. D. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, 77(s-1), 35-59.
- Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, 50(2-3), 344-401.
- Dechow, P. M., Richardson, S. A., & Tuna, I. (2003). Why are earnings kinky? An examination of the earnings management explanation. *Review of Accounting Studies*, 8, 355-384..
- Dechow, P. M., & Skinner, D. J. (2000). Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting Horizons*, 14(2), 235-250.
- DeFond, M. L., & Park, C. W. (2001). The reversal of abnormal accruals and the market valuation of earnings surprises. *The Accounting Review*, 76(3), 375-404.
- Dhaliwal, D. S., Gleason, C. A., & Mills, L. F. (2004). Last-chance earnings management: using the tax expense to meet analysts' forecasts. *Contemporary Accounting Research*, 21(2), 431-459.
- Dichev, I. D., Graham, J. R., Harvey, C. R., & Rajgopal, S. (2013). Earnings quality: Evidence from the field. *Journal of Accounting and Economics*, 56(2-3), 1-33.
- Dimitras, A. I., Kyriakou, M. I., & Iatridis, G. (2015). Financial crisis, GDP variation and earnings management in Europe. *Research in International Business and Finance*, 34, 338-354.
- Enomoto, M., Kimura, F., & Yamaguchi, T. (2015). Accrual-based and real earnings management: An international comparison for investor protection. *Journal of Contemporary Accounting & Economics*, 11(3), 183-198.
- Filip, A., & Raffournier, B. (2014). Financial crisis and earnings management: The European evidence. *The International Journal of Accounting*, 49(4), 455-478.
- Fischer, S. (1993). The role of macroeconomic factors in growth. *Journal of Monetary Economics*, 32(3), 485-512.
- Fitri, F. A., Syukur, M., & Justisa, G. (2019). Do the fraud triangle components motivate fraud in Indonesia?. *Australasian Accounting, Business and Finance Journal*, 13(4), 63-72.
- Franz, D. R., HassabElnaby, H. R., & Lobo, G. J. (2014). Impact of proximity to debt covenant violation on earnings management. *Review of Accounting Studies*, 19, 473-505.
- Gale, D. (1955). The law of supply and demand. *Mathematica Scandinavica*, 155-169.

- Gao, H., Zhang, H., & Zhang, J. (2018). Employee turnover likelihood and earnings management: evidence from the inevitable disclosure doctrine. *Review of Accounting Studies*, 23, 1424-1470.
- Gargouri, R. M., Shabou, R., & Francoeur, C. (2010). The relationship between corporate social performance and earnings management. *Canadian Journal of Administrative Sciences/Revue Canadienne Des Sciences De l'Administration*, 27(4), 320-334.
- Gava, A. M., & Vitiello, L. (2014). Inflation, Quarterly Balance Sheets and the Possibility of Fraud: Benford's Law and the Brazilian case. *Journal of Accounting, Business & Management*, 21(1).
- Geiger, M. A. (1994). Investor views of audit assurance: Recent evidence of the expectation A gap. *Journal of Accountancy*, 60.
- Ghosh, A., & Phillips, S. (1998). Warning: Inflation may be harmful to your growth. *Staff Papers*, 45(4), 672-710.
- Guay, W. R., Kothari, S. P., & Watts, R. L. (1996). A market-based evaluation of discretionary accrual models. *Journal of Accounting Research*, 34, 83-105.
- Gunny, K. (2005). What are the consequences of real earnings management. In *UMI Dissertation Services eBooks*. [http://w4.stern.nyu.edu/accounting/docs/speaker\\_papers/spring2005/Gunny\\_paper.pdf](http://w4.stern.nyu.edu/accounting/docs/speaker_papers/spring2005/Gunny_paper.pdf)
- Habib, A., Uddin Bhuiyan, B., & Islam, A. (2013). Financial distress, earnings management and market pricing of accruals during the global financial crisis. *Managerial Finance*, 39(2), 155-180.
- Healy, P. (1985). The impact of bonus schemes on the selection of accounting principles. *Journal of Accounting and Economics*, 7(1-3), 85-107.
- Healy, P. M., & Wahlen, J. M. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, 13(4), 365-383.
- Heymann, D., & Leijonhufvud, A. (1995). *High Inflation: The Arne Ryde Memorial Lectures*. Ryde Lectures.
- Hsieh, T. S., Kim, J. B., Wang, R. R., & Wang, Z. (2020). Seeing is believing? Executives' facial trustworthiness, auditor tenure, and audit fees. *Journal of Accounting and Economics*, 69(1), 101260.
- Huang, S. Y., Lin, C. C., Chiu, A. A., & Yen, D. C. (2017). Fraud detection using fraud triangle risk factors. *Information Systems Frontiers*, 19, 1343-1356.
- Hunjra, A. I., Ijaz, M., Chani, D. M. I., & Mustafa, U. (2014). Impact of dividend policy, earning per share, return on equity, profit after tax on stock prices. *International Journal of Economics and Empirical Research*, 2(3), 109-115.
- Jaggi, B., & Lee, P. (2002). Earnings management response to debt covenant violations and debt restructuring. *Journal of Accounting, Auditing & Finance*, 17(4), 295-324.
- Jelinek, K. (2007). The effect of leverage increases on earnings management. *The Journal of Business and Economic Studies*, 13(2), 24.
- Jones, J. J. (1991). Earnings Management During Import Relief Investigations. *Journal of Accounting Research*, 29(2), 193-228.
- Kim, J. B., Kim, J. W., & Lim, J. H. (2019). Does XBRL adoption constrain earnings management? Early evidence from mandated US filers. *Contemporary Accounting Research*, 36(4), 2610-2634.

- Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, 33(3), 375-400.
- Krieger, K., Mauck, N., & Pruitt, S. W. (2021). The impact of the COVID-19 pandemic on dividends. *Finance Research Letters*, 42, 101910.
- Lassoued, N., & Khanchel, I. (2021). Impact of COVID-19 pandemic on earnings management: An evidence from financial reporting in European firms. *Global Business Review*, 09721509211053491.
- Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: an international comparison. *Journal of Financial Economics*, 69(3), 505-527.
- Li, Y., Li, X., Xiang, E., & Djajadikerta, H. G. (2020). Financial distress, internal control, and earnings management: Evidence from China. *Journal of Contemporary Accounting & Economics*, 16(3), 100210.
- Little, I. M. D. (Ed.). (1993). *Boom, Crisis, and Adjustment: The Macroeconomic Experience of Developing Countries*.
- Lou, Y. I., & Wang, M. L. (2009). Fraud risk factor of the fraud triangle assessing the likelihood of fraudulent financial reporting. *Journal of Business & Economics Research (JBER)*, 7(2).
- Malinsky, G. (2023). U.S. unemployment just hit its lowest rate since 1969 – economists aren't optimistic it'll last. *CNBC*. From [www.CNBC.com](http://www.CNBC.com)
- Manurung, D. T., & Hadian, N. (2013). Detection fraud of financial statement with fraud triangle. *In Proceedings of 23rd International Business Research Conference* (Vol. 36, No. 8, pp. 1-18).
- Marra, A., Mazzola, P., & Prencipe, A. (2011). Board monitoring and earnings management pre-and post-IFRS. *The International Journal of Accounting*, 46(2), 205-230.
- Matsuura, S. (2008). On the relation between real earnings management and accounting earnings management: income smoothing perspective. *Journal of International Business Research*, 7, 63.
- Mcgregor, G. (2022). Luckin, the scandal-tainted Chinese coffee upstart, plots an improbable comeback from delisting and bankruptcy. *Fortune*. From [www.fortune.com](http://www.fortune.com)
- McNichols, M. F. (2002). Discussion of the quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, 77(s-1), 61-69.
- Mustafa, S. & Khan, D.F. (2020). The relationship between accounting frauds and economic fluctuations: A case of project based organizations in UAE. *Journal of Economics and Public Finance*, 6(1), p87.
- Nallareddy, S., Sethuraman, M., & Venkatachalam, M. (2020). Changes in accrual properties and operating environment: Implications for cash flow predictability. *Journal of Accounting and Economics*, 69(2-3), 101313.
- Omankhanlen, A. E., Tometi, E. A. F., & Urhie, E. (2021). Macroeconomic factors, corporate governance and financial malpractices in Nigerian banks. *Journal of Money Laundering Control*, 24(3), 647-658.
- Omidi, M., Min, Q., & Omidi, M. (2017). Combined effect of economic variables on fraud, a survey of developing countries. *Economics & Sociology*, 10(2), 267.
- Payne, J. L., & Robb, S. W. (2000). Earnings management: The effect of ex ante earnings expectations. *Journal of Accounting, Auditing & Finance*, 15(4), 371-392.

- Perols, J. L., & Lougee, B. A. (2011). The relation between earnings management and financial statement fraud. *Advances in Accounting*, 27(1), 39-53.
- Rajgopal, S., Venkatachalam, M., & Jiambalvo, J. (1999). Is Institutional Ownership Associated with Earnings Management and the Extent to which Stock Prices Reflect Future Earnings? *Social Science Research Network*.
- Remery, C., Henkens, K., Schippers, J., & Ekamper, P. (2003). Managing an aging workforce and a tight labor market: views held by Dutch employers. *Population Research and Policy Review*, 22(1), 21-40.
- Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics*, 42(3), 335-370.
- Rudd, K. (2009). The global financial crisis. *Monthly, The*, (Feb 2009), 20-29.
- Schuchter, A., & Levi, M. (2016). The fraud triangle revisited. *Security Journal*, 29, 107-121.
- Smialek, J., & Casselman, B. (2023). The Fed's Preferred Inflation Gauge Sped Back Up. *The New York Times*. From: <https://www.nytimes.com/2023/02/24/business/economy/inflation-spending-fed.html>
- Stock, J. H., & Watson, M. W. (2010). Modeling inflation after the crisis (No. w16488). *National Bureau of Economic Research*.
- Swagerman, A. (2023). Inflation rate 10.0 percent in 2022. *CBS*. From [www.cbs.nl](http://www.cbs.nl)
- The Guardian. (2015). Toshiba inflated profits. *The Guardian*. From [www.theguardian.com](http://www.theguardian.com)
- U.S. Bureau of Labor Statistics. (2023). Labor Force Statistics from the Current Population Survey. From [www.bls.gov](http://www.bls.gov)
- U.S. Bureau of Labor Statistics. (n.d.). Civilian unemployment rate. From [www.bls.gov](http://www.bls.gov)
- Wallace, A. (2023). The US economy grew by 2.9% in the fourth quarter, more than expected. *CNN*. From [www.CNN.com](http://www.CNN.com)
- Wells, J. T. (2017). *Corporate Fraud Handbook: Prevention and Detection*. John Wiley & Sons.
- Winters, M. (2022). Inflation reaches highest level since 1981: 'We don't see relief in sight,' says economist. *CNBC*. From [www.cnbc.com](http://www.cnbc.com)
- Wong, K. Y. (1992). Inflation, corruption, and income distribution: The recent price reform in China. *Journal of Macroeconomics*, 14(1), 105-123.
- Xu, R. Z., Taylor, G. K., & Dugan, M. T. (2007). Review of real earnings management literature. *Journal of Accounting Literature*, 26, 195.
- Yu, F. F. (2008). Analyst coverage and earnings management. *Journal of Financial Economics*, 88(2), 245-271.
- Zalata, A. M., Ntim, C. G., Choudhry, T., Hassanein, A., & Elzahar, H. (2019). Female directors and managerial opportunism: Monitoring versus advisory female directors. *The Leadership Quarterly*, 30(5), 101309.
- Zaman, R., Atawnah, N., Haseeb, M., Nadeem, M., & Irfan, S. (2021). Does corporate eco-innovation affect stock price crash risk?. *The British Accounting Review*, 53(5), 101031.

## A. Appendix A

**Table A – Variables**

Variable	Definition
<i>Discretionary accruals</i> <sub>it</sub>	The discretionary accruals of firm i in year t, measured by the error term of equation 1
<i>REM</i> <sub>it</sub>	The sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs of firm i in year t, measured by the sum of the error terms of equations 2.1, 2.2, and 2.3.
<i>Inflation rate</i> <sub>it(t-1, t-2)</sub>	The inflation rate of company i in year t (t-1, t-2). The inflation rate is measured on state level. The inflation rate is measured with the personal consumption expenditures
<i>Unemployment rate</i> <sub>it(t-1, t-2)</sub>	The unemployment rate of company i in year t (t-1, t-2). The unemployment rate is measured on state level.
<i>Analysts_following</i> <sub>it</sub>	The average analysts following of firm i in year t. <i>Analysts_following</i> <sub>it</sub> captures the external monitoring of a firm
<i>Institutional_ownership</i> <sub>it</sub>	The percentage of institutional ownership of firm i in year t. <i>Institutional_ownership</i> <sub>it</sub> captures the external monitoring of a firm i in year t.
<i>Discretionary expenses</i> <sub>it</sub>	The discretionary expenses of firm i in year t, measured by the sum of the advertising, the research and development, and the selling, general, and administrative expenses
<i>CFO</i> <sub>it(t-1, t+1)</sub>	The cash flow from operation of firm i in year t (t-1, t+1)
<i>PROD</i> <sub>it</sub>	The production costs of firm i in year t, measured by the sum of the cost of goods sold in year t and the change in inventory in year t compared to year t-1.
<i>ACC</i> <sub>it</sub>	The total accruals of firm i in year t, measured by earnings before extraordinary items minus cash flow from operations
<i>A</i> <sub>it-1</sub>	The total assets of firm i at the beginning of year t
<i>S</i> <sub>it-1</sub>	The total sales of firm i in year t-1
$\Delta S$ <sub>it</sub>	The change in sales revenue of firm i in year t
$\Delta S$ <sub>it-1</sub>	The change in sales revenue of firm i in year t-1
<i>PPE</i> <sub>it-1</sub>	The property, plant, and equipment of firm i at the beginning of year t
<b>Control Variables</b>	
<i>MVE</i> <sub>it</sub>	The log of the multiply of the price per share of firm i at the end of year t by the number of shares outstanding of firm i at the end of year t
<i>MTB Ratio</i> <sub>it-1</sub>	The market value of equity divided by the book value of equity of firm i at the beginning of year t

---

*Continued*

---

<i>Leverage<sub>it-1</sub></i>	The total debt of firm i at the beginning of year t divided by the total assets of firm i at the beginning of year t
<i>ROA<sub>it</sub></i>	The earnings before extraordinary items of firm i in year t divided by the assets of firm i at the beginning of year t
<i>TA<sub>growth</sub><sub>it</sub></i>	The difference between the total assets of firm i at the ending of year t to the beginning of year t, divided by the total assets of firm i at the beginning of year t
<i>Size<sub>it-1</sub></i>	The size of firm i in year t is measured by the log of the total assets of firm i at the beginning of the year
<i>Employment<sub>growth</sub><sub>it</sub></i>	The difference between the amount of employment of firm i at the ending of year t to the beginning of year t, divided by the employment of firm i at the beginning of year t

---

Note. Table A contains the descriptions of the variables used in this paper.

**B. Appendix B****Table B – Sample Selection**

	Observations
Start: Observations Compustat 2010-2021	177,010
Less: rows with missing values	(162,050)
Less: firms with sales <10m	(1,085)
Less: financial services firms (SIC code between 6000-6999)	(190)
Less: utility firms (SIC code between 4900-4999)	(354)
Less: rows with missing values after creating new variables	(2,278)
Less: matching data with Unemployment rate data and Inflation data	(614)
Less: matching data with analyst following data	(1,968)
Less: matching data with institutional ownership data	(1,641)
<b>Total Observations</b>	<b>6,830</b>

Note. Table B shows how the amount of observations for the regressions are obtained.

### C. Appendix C

**Table C – Difference Coefficients**

Table – Panel - Column	Hypothesis	F-Value
2 – A – 1	$\text{Inflation}_{it} + \text{Inflation}_{it-1} = 0$	3.7093*
2 – A – 2	$\text{Unemployment rate}_{it-1} + \text{Unemployment rate}_{it-2} = 0$	1.7618
2 – B – 2	$\text{Unemployment rate}_{it} + \text{Unemployment rate}_{it-1} + \text{Unemployment rate}_{it-2} = 0$	2.3148
D – A – 2	$\text{Inflation}_{it-2} + \text{Inflation}_{it-3} = 0$	2.7579*
D – B – 1	$\text{Unemployment rate}_{it-1} + \text{Unemployment rate}_{it-2} = 0$	0.3525
D – B – 3	$\text{Unemployment rate}_{it-1} + \text{Unemployment rate}_{it-2} = 0$	0.6130
D – D – 3	$\text{Unemployment rate}_{it-1} + \text{Unemployment rate}_{it-5} = 0$	0.3640

Note. Table C shows whether the difference between certain coefficients is significant. Column 1 shows in which table, panel, and column the coefficients are shown. Column 2 shows the hypothesis that is tested and column 3 shows the F-values. \* implies  $p < 0.10$ , \*\* implies  $p < 0.05$ , and \*\*\* implies  $p < 0.01$



## D. Appendix D

Table D – Relation between the Inflation Rate and the Unemployment Rate on Earnings Management

Panel A: Dependent variable = <i>Discretionary Accruals<sub>it</sub></i> , independent variable = <i>Inflation<sub>it</sub></i>						
	(1)		(2)		(3)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
<i>Intercept</i>	0.0407***	8.195	0.0371***	7.330	0.0428***	8.218
<i>MF<sub>it-1</sub></i>	(0.2109)***	(5.150)			(0.2098)***	(5.121)
<i>MF<sub>it-2</sub></i>	(0.0718)	(0.876)	(0.2216)***	(2.878)	(0.0357)	(0.416)
<i>MF<sub>it-3</sub></i>	(0.0092)	(0.175)	0.0891*	1.751	(0.0268)	(0.477)
<i>MF<sub>it-4</sub></i>			(0.0341)	(0.673)	(0.0090)	(0.172)
<i>MF<sub>it-5</sub></i>					(0.0781)	(1.492)
<i>MVE<sub>it</sub></i>	(0.0114)***	(10.79)	(0.0109)***	(10.36)	(0.0114)***	(10.81)
<i>MTBRatio<sub>it-1</sub></i>	0.0000**	2.192	0.0000**	2.125	0.0000**	2.174
<i>Leverage<sub>it-1</sub></i>	0.0399***	10.35	0.0412***	10.69	0.0402***	10.41
<i>ROA<sub>it</sub></i>	0.3186***	54.44	0.3181***	54.24	0.3185***	54.40
<i>TA<sub>growth</sub><sub>it</sub></i>	0.0199***	6.561	0.0200***	6.569	0.0201***	6.610
<i>Size<sub>it-1</sub></i>	0.0048***	4.311	0.0044***	3.895	0.0049***	4.322
<i>Employment<sub>growth</sub><sub>it</sub></i>	(0.0262)***	(6.570)	(0.0256)***	(6.411)	(0.0262)***	(6.569)
Adj. R <sup>2</sup>	0.3175		0.3149		0.3175	
Number of observations	6,830		6,830		6,830	

Panel B: Dependent variable = <i>Discretionary Accruals<sub>it</sub></i> , independent variable = <i>Unemployment rate<sub>it</sub></i>						
	(1)		(2)		(3)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
<i>Intercept</i>	0.0285***	5.730	0.0379***	7.703	0.0302***	5.539
<i>MF<sub>it-1</sub></i>	0.3054***	5.729			0.2969***	5.436
<i>MF<sub>it-2</sub></i>	(0.3804)***	(2.643)	(0.0668)	(0.415)	(0.4230)**	(2.444)
<i>MF<sub>it-3</sub></i>	0.1093	0.847	0.0466	0.219	0.1615	0.733
<i>MF<sub>it-4</sub></i>			(0.0915)	(0.951)	0.0220	0.144
<i>MF<sub>it-5</sub></i>					(0.0530)	(0.587)
<i>MVE<sub>it</sub></i>	(0.0115)***	(10.99)	(0.0109)***	(10.42)	(0.0115)***	(10.95)
<i>MTBRatio<sub>it-1</sub></i>	0.0000**	2.271	0.0000**	2.143	0.0000**	2.271
<i>Leverage<sub>it-1</sub></i>	0.0392***	10.10	0.0399***	10.28	0.0392***	10.11
<i>ROA<sub>it</sub></i>	0.3202***	54.89	0.3193***	54.61	0.3201***	54.84
<i>TA<sub>growth</sub><sub>it</sub></i>	0.0193***	6.348	0.0189***	6.211	0.0192***	6.316
<i>Size<sub>it-1</sub></i>	0.0050***	4.473	0.0045***	3.980	0.0050***	4.464
<i>Employment<sub>growth</sub><sub>it</sub></i>	(0.0261)***	(6.548)	(0.0245)***	(6.151)	(0.0260)***	(6.516)
Adj. R <sup>2</sup>	0.3178		0.3146		0.3177	
Number of observations	6,830		6,830		6,830	

Panel C: Dependent variable = $REM_{it}$ , independent variable = $Inflation\ rate_{it}$						
	(1)		(2)		(3)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
<i>Intercept</i>	0.5936***	28.75	0.6017***	28.61	0.5992***	27.67
<i>MF<sub>it-1</sub></i>	0.3458**	2.031			0.3487**	2.048
<i>MF<sub>it-2</sub></i>	0.3992	1.170	0.6416**	2.008	0.5214	1.461
<i>MF<sub>it-3</sub></i>	(0.2041)	(0.937)	(0.3447)	(1.632)	(0.2760)	(1.179)
<i>MF<sub>it-4</sub></i>			(0.0309)	(0.147)	0.0260	0.120
<i>MF<sub>it-5</sub></i>					(0.2583)	(1.186)
<i>MVE<sub>it</sub></i>	0.0057	1.298	0.0049	1.119	0.0056	1.279
<i>MTBRatio<sub>it-1</sub></i>	0.0000***	3.688	0.0000***	3.710	0.0000***	3.674
<i>Leverage<sub>it-1</sub></i>	0.0583***	3.638	0.0564***	3.521	0.0590***	3.676
<i>ROA<sub>it</sub></i>	0.4943***	20.31	0.4950***	20.34	0.4939***	20.29
<i>TA<sub>growth</sub><sub>it</sub></i>	(0.0224)*	(1.776)	(0.0225)*	(1.782)	(0.0219)*	(1.734)
<i>Size<sub>it-1</sub></i>	(0.0919)***	(19.68)	(0.0911)***	(19.57)	(0.0919)***	(19.67)
<i>Employment<sub>growth</sub><sub>it</sub></i>	0.0617***	3.726	0.0608***	3.676	0.0615***	3.718
Adj. R <sup>2</sup>	0.2043		0.2038		0.2042	
Number of observations	6,830		6,830		6,830	

Panel D: Dependent variable = $REMit$ , independent variable = $Unemployment\ rate_{it}$						
	(1)		(2)		(3)	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
<i>Intercept</i>	0.5950***	28.76	0.5756***	28.24	0.5753***	25.37
<i>MF</i> <sub><i>it-1</i></sub>	(0.4832)**	(2.180)			(0.3812)*	(1.680)
<i>MF</i> <sub><i>it-2</i></sub>	(0.1507)	(0.252)	(0.2364)	(0.354)	0.2555	0.355
<i>MF</i> <sub><i>it-3</i></sub>	0.8645	1.611	0.2642	0.300	0.4412	0.482
<i>MF</i> <sub><i>it-4</i></sub>			0.5338	1.337	(0.4102)	(0.646)
<i>MF</i> <sub><i>it-5</i></sub>					0.6681*	1.782
<i>MVE</i> <sub><i>it</i></sub>	0.0056	1.278	0.0044	1.014	0.0054	1.229
<i>MTBRatio</i> <sub><i>it-1</i></sub>	0.0000***	3.650	0.0000***	3.694	0.0000***	3.650
<i>Leverage</i> <sub><i>it-1</i></sub>	0.0619***	3.846	0.0608***	3.777	0.0614***	3.812
<i>ROA</i> <sub><i>it</i></sub>	0.4915***	20.27	0.4935***	20.35	0.4926***	20.31
<i>TA_growth</i> <sub><i>it</i></sub>	(0.0191)	(1.511)	(0.0181)	(1.438)	(0.0181)	(1.439)
<i>Size</i> <sub><i>it-1</i></sub>	(0.0920)***	(19.77)	(0.0910)***	(19.61)	(0.0920)***	(19.75)
<i>Employment_growth</i> <sub><i>it</i></sub>	0.0596***	3.602	0.0569***	3.440	0.0584***	3.525
Adj. R <sup>2</sup>	0.2051		0.2047		0.2054	
Number of observations	6,830		6,830		6,830	

Note. Table D presents the results of the tests of the relations between the inflation rate (1) and the unemployment rate (2) and earnings management.  $MF_{it(t-1,t-2)}$  captures the macroeconomic factor that is being tested, thus it captures either the inflation rate or the unemployment rate. In panel A and C  $MF$  presents the inflation rate and in panel B and D  $MF$  captures the unemployment rate. In panel A and B accrual earnings management is measured with the discretionary accruals (the residuals of equation 1). In panel C and D real earnings management is measured with the sum of the abnormal discretionary expenses, the abnormal operating cash flow, and the abnormal production costs (the sum of the residuals of equation 2.1, 2.2, and 2.3). The control variables are described in table A in appendix A. The continues variables are winsorized at the 1 and 99 percent levels. A negative variable is presented is brackets. \* implies  $p < 0.10$ , \*\* implies  $p < 0.05$ , and \*\*\* implies  $p < 0.01$