Master's thesis

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Do Norwegian municipalities use earnings management to delist from the Register for Governmental Approval of Financial Obligations (ROBEK)?

Master's thesis in Business Administration
Supervisor: Levi Gårseth-Nesbakk
Trondheim, May 2017

Master's thesis in Økonomi og administrasjon
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May 2019

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Benytter norske kommuner earnings management for å komme seg ut av Register for betinget godkjenning og kontroll (ROBEK)?

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Acknowledgements

This thesis represents the end of our master's degree in Business and Administration at NTNU Business School. We would like to thank our supervisor, Pro-Rector Levi Gårseth-Nesbakk, for guidance throughout the process. Furthermore, we would also like to acknowledge the valuable comments and helpful guidance from PhD Candidate Ane Tolnes Haugdal and Associate Professor Per Christian Ahlgren. Finally, we would like to thank the fellow students and the staff at NTNU Business School for interesting discussions and support. We take full responsibility for the content of this thesis.

Trondheim, 23.05.2019

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Abstract

This thesis studies whether a signal indicating poor fiscal performance can influence the earnings management behaviour in the municipal sector. Following prior research, well-established discretionary accruals models are used to estimate earnings management behaviour. We analyze the size of the discretionary accruals and our findings suggest that municipalities included in the Robek Register use earnings management to delist from the Register. This is because municipalities have a higher level of income-increasing or a lower level of income-decreasing earnings management the year they are delisted from Robek compared to the previous year and the year after leaving the Register. This thesis contributes to the existing literature in several ways. First and foremost, we supplement the earnings management literature in the public sector. Increased knowledge about earnings management in the municipal sector could help regulatory bodies to develop standards more suitable for the public sector and prevent future politicians and managers from behaving fraudulently, which could jeopardize future sustainability. In addition, to the best of our knowledge, this is the first study to connect earnings management in the municipal sector to a signal indicating poor fiscal performance, such as Robek.

Sammendrag

Denne masteroppgaven undersøker om et signal som indikerer svak finansiell prestasjon kan påvirke graden av earnings management aktivitet i kommunesektoren. I likhet med tidligere forskning så bruker vi skjønnsmessige periodiseringer som mål på earnings management. Vi analyserer størrelsen på de skjønnsmessige periodiseringene, og våre funn indikerer at kommuner på Robek-listen tar i bruk earnings management som et virkemiddel for å komme seg ut av registeret. Vi finner at kommuner har et høyere nivå av inntektsøkende skjønnsmessige periodiseringer eller et lavere nivå av inntektsreduserende skjønnsmessige periodiseringer året de kommer seg ut av Robek, målt opp imot året før og året etter. Denne studien bidrar til eksisterende litteratur på flere måter. Først og fremst supplementerer den tidligere forskning om earnings management i offentlig sektor. Økt kunnskap om earnings management i kommunesektoren kan hjelpe myndighetene til å utvikle standarder som er mer egnet for offentlig sektor og dermed hindre fremtidige politikere og ledere fra å handle opportunistisk, som kan være et hinder for fremtidig bærekraft. I tillegg er dette så vidt vi vet den første studien som kobler earnings management i kommunesektoren med et signal som indikerer svak finansiell ytelse, slik Robek er for kommunesektoren i Norge.

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1. Introduction

The earnings management literature has traditionally focused on the private sector (e.g. Jones, 1991; Leuz et al., 2003). Recently, the scope of earnings management research has broadened to include the non-profit and the public sector, but this literature is rather recent and less extensive (Verbruggen and Christiaens, 2012). In a Norwegian context, we have only been able to find research conducted in the private sector (e.g. Kinserdal, 2006). With our study we want to contribute to closing the gap in the research on earnings management in the public sector.

Few researchers have addressed the potential issue of earnings management in the public sector. Previous work has been limited to investigate whether municipalities use earnings management to report positive net earnings close to zero (e.g. Ferreira et al., 2013; Leone and Van Horn, 2005; Cohen and Malkogianni, 2017; Pellicer et al., 2013). In our study we have chosen a different approach. We want to study whether a signal indicating poor fiscal performance can influence the earnings management behaviour in the municipal sector. In other words, we want to study whether to avoid being characterized as a weak economic operator in the municipal sector is an incentive sufficiently strong to resort to a greater extent of earnings management.

Motives for earnings management exist both in the private and the public sector, although with different purposes. In the public sector, politicians and managers might engage in earnings management activities for several reasons. Firstly, they may be required to meet specific financial objectives set by higher levels of authority (Pellicer et al., 2013). Secondly, they may use a break-even position to signal a good performance (Verbruggen and Christiaens, 2012) and in this way increase the reelection probability (Hopland, 2014). If managers or politicians engage in earnings management activities, inefficiencies in the management of public resources will arise (Ferreira et al., 2013). Therefore, the reliability of financial reports is important. Increased knowledge about earnings management in the municipal sector could help regulatory bodies in developing standards more suitable for the public sector and prevent future politicians and managers from behaving fraudulently, which could jeopardize future sustainability.

The Register for Governmental Approval of Financial Obligations (hereafter: Robek) is a register for Norwegian municipalities in financial imbalance (Regjeringen, 2014). The Register is considered a "blacklist" and being on the list means that the municipality has less economic freedom and is under regulation (Haraldsvik et al., 2018). Robek is considered to be a signal indicating poor fiscal performance (Hopland, 2013). Some research has been conducted on the Robek Register (e.g. Hopland, 2014) but, to our knowledge, nobody has studied it in relation to earnings management. The purpose of this paper is to supplement the earnings management literature on the public sector by investigating whether Norwegian municipalities undertake earnings management actions in order to improve their financial profile to delist from Robek. Research on Robek is important; the consequences of this list interfere with the local democracy because freedom is diminished for municipalities under administration (Løvslett, 2014).

Following prior research from the private sector, earnings management measured with models based on discretionary accruals is well established in the literature (Misje and Kosberg, 2018). These models have also been used when measuring earnings management in the public sector (e.g. Beck, 2018). In our study, we used the Jones (1991) model and the modified Jones model (Dechow et al. 1995). We estimated the size of the discretionary accruals for a group of municipalities which have left Robek and a control group consisting of municipalities which has never been on Robek during the same time period. In addition, we investigated whether there were differences for the Robek group in the average size of the discretionary accruals the year before delisting, the year they were delisted and the year after. Even though we found conflicting results, the evidence from this study implies that Norwegian municipalities use earnings management as a way of delisting from the Robek Register.

This paper is divided into six sections. The second section gives a brief overview of the previous literature on earnings management in the public sector, relevant theories and contextual information. Section three provides the theoretical development of the hypotheses, followed by section four which explains the methodology used. The fifth section analyzes our findings and section six concludes our findings, limitations and suggestions for future research.

2. Literature review

2.1 Literature review – earnings management

Several definitions of earnings management can be found, but the most common definition of earnings management is Healy and Whalen's (1999, p. 368):

"Earning management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers"

The definition of Healy and Wahlen (1999) divides earnings management into two different categories, real activities manipulation and accrual-based earnings management. Both earnings management strategies are purposeful actions to alter reported earnings in a specific direction. Real activities manipulation is achieved by changing the timing or structure of operations, investments or financing transactions. Accrual-based earnings management is on the other hand achieved through changing the accounting methods or estimates used when presenting a given transaction in the financial statements (Zang, 2012). Accrual earnings management is in other words the opportunistic exploitation of accounting standards. Given the time, data-availability and the need of comparability, our study is based on accrual-based earnings management.

Ferreira et al. (2013) find that discretionary accruals are used by local politicians in Portuguese municipalities to report positive net earnings close to zero. Local politicians do this to demonstrate that public resources are managed according to economic and efficiency principles. Another interesting result from this study is that they found an overriding tendency to avoid reporting losses in municipalities where the political competition is greatest. Considering the agency theory (Zimmerman, 1977) and a study undertaken by Buchanan and Tullock (1962), we can assume that these politicians have selfish motives with an objective to maximize votes. Additionally, the likelihood of more prevalent earnings management increases with higher competition (Ferreira et al., 2013).

The municipalities seek to provide the most efficient use of their resources in accordance with the citizens' needs. These resources come mainly from citizen taxes, which is why earnings

reported by municipalities is relevant (Ferreira et al., 2013). Negative or high positive earnings may be regarded as a sign of incompetence by citizens and other stakeholders (Verbruggen and Christiaens, 2012; Ferreira et al. 2013). For example, high positive earnings could mean tax overloads and negative earnings could be due to overuse of resources required to meet the needs of the citizens. Reporting positive earnings close to zero is a clear incentive for earnings management in the non-profit sector, as it indicates good performance. Several researchers have studied this; Leone and Van Horn (2005), Verbruggen and Christiaens (2012), Ferreira et al. (2013), Cohen and Malkogianni (2017) and Pellicer et al. (2013), all find evidence that non-profit organizations use earnings management to ensure that earnings are positive but close to zero.

Other literature has shown several reasons for organizations in the public sector to adjust their accounting numbers: avoiding taxes (Hofmann, 2007; Omer & Yetman, 2003, 2007), avoiding small losses (Ballantine et al. 2007; Leone & Van Horn, 2005), gaining higher capital contributions (Pilcher and Van Der Zahn, 2010; Verbruggen and Christiaens, 2012; Bouwens et al. 2004) and improving their efficiency ratios (Jones & Roberts, 2006; Keating et al. 2008; Khumawala et al. 2005; Krishnan et al. 2006).

2.2 Relevant theories

Public financial management has been reformed, especially over the last 25-30 years (Mellemvik et al., 2012). The introduction of New Public Management in the public sector has raised attention regarding efficiency and financial responsibility which has led to the adoption of many management ideals and accounting techniques from the private sector (Hood, 1995). A crucial example from the New Public Management movement has been the adoption of accrual accounting. This choice has not been officially made in the municipal sector in Norway, but especially during the last decade, the Norwegian Accounting Act has inspired the way municipalities do their accounting (Mellemvik et al., 2012). The introduction of accrual accounting in the public sector aims to eliminate information asymmetry between the government and the stakeholders as well as to increase the efficiency and support better decision-making (Hyndman and Connolly, 2011). However, implementation of accrual accounting in the public sector has met resistance. Some scholars state that the adoption of accrual accounting to the public sector could offer politicians and managers greater opportunities for manipulation (Hepworth, 2003, Stalebrink and Sacco, 2007, Pilcher and Van Der Zahn, 2010).

Even though accrual accounting has been implemented in the public sector of Norway, local governments must obey the accounting policy provided by the ordinance principle. The ordinance principle could be considered as an intermediate between an accrual model and a cash model, often referred to as modified accrual model (Mellemvik et al., 2012). This principle means that all known income/receipts and expenses/payments for the year are included in the current year, irrespective of the fact of whether they have been paid when the accounts are closed or not. A "known" transaction means that goods or services must be received or delivered/performed during the accounting period, but it is not the payment date that is the key to accounts' entries. The general rule is that it should be dated on the acquisition or utilization day (Regjeringen, 2012).

In the private sector we recognize the agency theory as the relationship between shareholders as principals, and companies as agents (Zimmerman, 1977). In the public sector (e.g. municipalities) the relationship between principals and agents has been shown to be more complex than in the private sector (Pellicer et al., 2013). Agency theory and positive accounting theory (Watts and Zimmerman, 1986) state that agents find incentives for earnings management in order to offer the best perception of their performance for reasons including professional prestige, job maintenance, targets agreed with parent entities, and contracts based on achieving specific accounting figures (Beattie, 2002). Local governments, such as municipalities in Norway, do not have profits as a primary objective. Pellicer et al. (2013) states that local governments do not seek profits; they seek to provide services to citizens while maintaining a reasonable balance between expenditures and income. As a result, the study suggests that the appropriate term for earnings management in local governments is "accounting numbers management". In municipalities, officials and elected politicians may feel forced to engage in accounting numbers management by goals stemming from political campaigns or management plans (Pellicer et al., 2013).

The public choice theory is closely connected to the agency theory. Both these theories provide a backdrop to analyze the possible motives for politicians and managers to engage in earnings management activities. Boyne (1997) used public choice theory in order to explain the different incentives associated with municipalities. He states that there are two assumptions concerning municipalities, the self-interest axiom and the pressure of competition. The self-interest axiom suggests that local administrators are motivated to manipulate economic policies to their own advantage (Ferreira et al., 2013). The pressure of

competition refers to the competition which compels politicians to be redirected towards the public interest. These conflicting interests and the information asymmetry between the citizens and the politicians create a fertile ground for the manipulation of reported earnings (Boyne, 1997). On one side, the politicians want to be re-elected to pursue their own interests, (Buchanan and Tullock, 1962), and on the other side, the citizens want to monitor the actions of the politicians to ensure the maximization of their welfare (Cohen and Malkogianni, 2017).

2.3 Contextual information

The public sector in Norway is divided into three levels: municipalities, county municipalities, and the state level. Municipalities are the lowest level, and this level is our focus for this study. Over time there has been a reduction of the number of municipalities in Norway, mainly because of municipalities merging (Mellemvik et al., 2012**)**. At the beginning of 2017, there were 426 Norwegian municipalities (Regjeringen, 2016). The municipalities are led by a council, consisting of politicians where the mayor is in charge. The administrative side is led by the chief administrative officer (Mellemvik et al., 2012). The municipalities are regulated by the act for municipalities and county municipalities (The Local Government Act) and related regulations (Kommuneloven, 2018). The Local Government Act also regulates the criteria for inclusion into Robek.

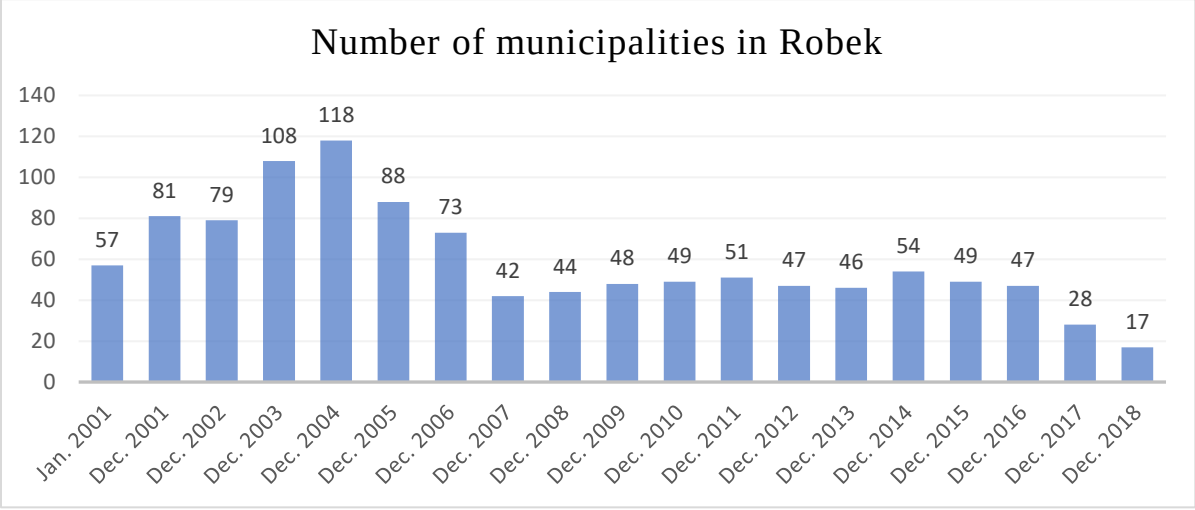

Figure 1: Number of municipalities listed on Robek (Regjeringen, 2018).

The Robek Register was introduced in Norway in 2001 as a consequence of the softening of the balance budget regulation (Haraldsvik et al., 2018). Before 2001 the Norwegian state oversaw the budget and loans for all the municipalities. Following the introduction of the

Robek Register, it is now only the municipalities in the Register that are under control. These municipalities have violated the balance budget regulation (Hopland, 2014). The most common reason for municipalities figuring in the Register is that they have a persistent deficit. In other words, they have a negative net operating profit which cannot be financed by their reserves. If the municipalities use more than two years to cover the deficit, they enter the Register (Haraldsvik et al., 2018). The Register peaked in 2004 with 118 municipalities in the Register and are currently at its lowest level ever, with 17 municipalities at the end of 2018. Recently, there has been a high level of attention regarding the public sector in Norway, both related to municipalities merging and the Robek Register. A reason for the increased attention in Robek is because the Register had steadily listed between 42 and 54 municipalities in the years 2007 to 2016, but has dropped to 17 in the last two years.

The Robek Register was founded so that the Ministry of Local Government and Modernization could simplify the municipality's economy, conferring a higher level of autonomy to the municipalities (Løvslett, 2014) and lowering the complexity and cost of public monitoring (Hopland, 2014). This can be characterized by the term "Vertical fiscal imbalance", which signifies decentralized spending responsibility with centralized financing (Borge and Rattsø, 2002). The municipalities and the state are mutually dependent, with the state being the superior agent. The Norwegian system is built upon the unitary state, which means that the central authority grants power to the municipalities (Lyngstad, 2003).

Hopland (2013) and Mørch-Olsen (2013) studied Robek and both found evidence suggesting that municipalities in the Register improved their operating surplus, mainly due to cost reductions. Furthermore, Hopland (2013) describes a formal and an informal mechanism in relation to Robek. The formal mechanism is that the municipalities in Robek are subject to closer central government monitoring and they are forced to be more realistic in their budgeting. The informal mechanism is the negative attention in local media as a result of inclusion in Robek. Hopland (2014) investigated this informal mechanism to a deeper extent. The results of his study indicate that voters value the information embedded in the Robek signal effect and take it into account when they are casting their votes. Appearing on the Robek Register is a highly visible and very reliable indicator of poor performance (Hopland, 2014).

Finally, the last study we want to highlight is the study undertaken by Lunder and Jenssen (2017). Interestingly, one of their informants stated that municipalities on the Robek list are not following the regulations, especially regarding the operations and investments accounts. The informant said that operation activities were found in the investment's accounts, and he considered this as a sign indicating that they have the intention of exiting Robek. This statement implies that Robek municipalities are willing to break regulations to delist from Robek. Lunder and Jenssen (2017) also found that the opposite is happening in rich municipalities. They are putting investments in the operations' accounts to lower the results, because they do not want to show a result too high. This is in line with other previous research carried out in the public sector (e.g. Ferreira et al., 2013; Leone and Van Horn, 2005).

3. Hypothesis development

In this section, we will develop our three hypotheses testing for earnings management in the public sector. We will focus mainly on literature supporting our hypotheses, however, we will also mention different views from existing literature, which we will highlight further in the empirical findings section of the paper.

Research on Robek and earnings management in the public sector gives an indication of what to expect from our hypotheses. Scholars suggest that adoption of accrual accounting in the public sector may offer the politicians and managers greater opportunities for manipulation (e.g. Hepworth, 2003, Stalebrink and Sacco, 2007, Pilcher and Van der Zahn, 2010). In addition, Cohen and Malkogianni (2017) also find that the likelihood that municipalities will engage in earnings management activities is greater when the financial performance of the municipalities is poor.

In our literature review we have seen that politicians and managers have different incentives to use earnings management activities. As an example, Verbruggen and Christiaens (2012) state that negative earnings or high positive earnings are considered by the citizens to be a sign of incompetence. Therefore, managers have an incentive to push the result close to zero. This is in line with other studies carried out in the public sector (e.g. Ferreira et al. 2013, Leone and Van Horn 2005, Verbruggen and Christiaens 2012, Cohen and Malkogianni 2017 and Pellicer et al. 2013). Stalebrink (2007) published a similar study concerning the case of Swedish municipalities, but he particularly focused on capital depreciation and asset write-

offs. He found that income-increasing earnings management were used to reduce the deficits, and income-decreasing to reduce the surpluses. Interestingly, this provided the same results as the other studies mentioned. The combination of greater opportunities and the different incentives for the politicians and managers to engage in earnings management activities might be dangerous for local democracy because politicians and managers may exploit the system at the expense of the citizens.

Norwegian studies about Robek show different incentives for earnings management. Hopland (2014) found that entering Robek influences election results and reelection probability. His findings showed that the vote share for the incumbent party is reduced by about three percentage points, while the reelection probability is reduced by about twelve percentage points. We expect that leaving Robek affects the vote shares and reelection probability in the opposite direction. Hence, this can be looked upon as an incentive for politicians to use earnings management to delist from the Register. Hopland's findings have a strong connection with the agency theory (Zimmerman, 1977) and the public choice theory (Boyne, 1997). The politicians have incentives to use earnings management to give the best view of their performance for reasons such as professional prestige and maintenance of their position (Zimmerman, 1977; Buchanan and Tullock, 1962).

Several studies show that Norwegian municipalities want and try to delist from Robek. As an example, the analysis done by Haraldsvik et al. (2018) shows that municipalities temporarily increase the property tax in order to leave Robek, and adjust it back to the normal level after leaving the Register. In the study conducted by Minnesjord (2016) all the informants from earlier Robek municipalities agreed that it was a relief when the time in the Register ended. Robek is considered as a "blacklist" for local politicians (Hopland, 2013). The Register is receiving a high-level of media coverage, and the Register has gained general importance (Lalim, 2016). Since the municipalities want to leave the Robek Register, earnings management can be considered as an instrument to make it happen. Once a municipality is listed in Robek, exiting would demonstrate a strong sign of improved performance (Hopland, 2014).

Based on the existing literature and our discussion above, we expect the earnings management activities to be higher for the municipalities delisting from the Robek Register compared with

the municipalities which are not in the Register. To test this, we have developed the following hypothesis:

H1: Municipalities on the Robek list use more earnings management the year they are delisted from Robek than a control group with municipalities not on the Robek list.

Haraldsvik et al. (2018) find evidence that municipalities listed on Robek feel forced to be creative and to come up with innovative solutions. Another interesting observation from Haraldsvik et al. (2018) is that municipalities want to extricate themselves from Robek as soon as possible and seek actions with quick effect on the bottom line. In addition, Borge and Hopland (2018) find that municipalities entering Robek become more efficient, but that the efficiency drops to the same level as before the registration after the municipalities have abandoned the Register. Therefore, we suspect that the municipalities may be too creative the year they exit the Register.

Overall, prior research (e.g. Verbruggen and Christiaens, 2012; Ferreira et al. 2013) has identified reasons for us to expect the level of earnings management to be higher in the year the municipality leave Robek than the previous year and the year after leaving Robek. In consequence, we posit the two following hypotheses:

H2: Municipalities are using more income-increasing or less income-decreasing accruals the year they leave Robek than the year before they are delisted.

H3: Municipalities are using more income-increasing or less income-decreasing accruals the year they leave Robek than the year after they are delisted.

4. Methodology

4.1 Event period

For the Robek group to be large enough for us to analyze, we decided to include data from a ten-year period, 2008 to 2017. This time period includes the financial crisis in 2008 and the Terra Securities scandal affecting some of the municipalities in our data sample. Seven out of the 243 municipalities in our data sample were affected by the Terra scandal. We did not include 2018 because the financial statements were not available. We collected data for the

specific year the municipality left Robek, including the year after and the two years before leaving Robek, to be able to calculate the discretionary accruals (DACC). This meant that we needed data back to 2005 in order to calculate DACC for the whole period, including the year before delisting (t-1), the year delisting (t) and the year after (t+1). We were able to collect the data we needed for all the years except 2005. Because of that we do not have any $DACC_{t-1}$ calculated for the 13 municipalities leaving Robek in 2008. For the control group we collected data from 2006 until 2017 and calculated the discretionary accruals for all the municipalities each year of the time period.

4.2 Data and sample selection

The sample used in this study includes the annual financial statements of 243 municipalities including both municipalities from the Robek group and the control group. Financial statements are collected from the KOSTRA[1] database in SSB[2]. The software program we used to analyze the data was Stata.

We started out by creating the Robek group. Some municipalities have been in and out of the Robek Register twice in the period we studied. We chose to include the few municipalities that were listed several times because the time period between the exits were four or more years. In this way our data sample grew to a satisfying size. The number of municipalities exiting the Robek Register in our time period was 129. Then we continued with the selection of municipalities for our control group. We wanted to have a homogenous control group consisting of municipalities characterized by a solid economy. By doing this, we tried to avoid having municipalities that were close to entering Robek in our control group. The reason why we did not want to include those municipalities was due to the possibility that they used earnings management to avoid being listed on Robek.

In order to form a control group consisting of municipalities with a solid economy, we chose to establish two key figures to assess which municipalities we should include. The first key figure we used was net operating profit as a percentage of gross operating revenues. Our requirement was that municipalities needed to have more than 1,5% to be included in the control group. Haraldsvik et al. (2018) classified municipalities with larger net operating

[1] KOSTRA is an accounting system used by Norwegian municipalities when reporting to the central government. This is a public database (SSB, 2014).
[2] SSB is the Norwegian statistics bureau (SSB, 2019).

profit than 1,75% as municipalities with a solid economy and with a low chance of ending up on the Robek list. We chose to have a slightly lower requirement (1,5%) to be able to include a greater number of municipalities in our control group.

We used net debt per capita as our second key figure. We calculated the average for all municipalities which have not been on the Robek list and started out with including every municipality that has net debt less than the average. In order to obtain a control group with a satisfying size, we chose to expand the control group with the municipalities that have up to 12 000 NOK greater net debt per capita than the average, if they have net operating profit larger than the average. Eventually we decided to include every municipality with over 6% net operating profit as a percentage of gross operating revenues, no matter what net debt per capita they have. We also excluded the municipalities for which we did not find enough data, and those who merged with other municipalities during our time period.

Table 1: Sample selection (control group)

Municipalities never registered on Robek	207
- Merging of municipalities	6
- Lack of data	2
= Firms included in the sample	199
- Net operating profit as a percentage of gross operating revenues[3]	12
- Net debt per capita[4]	55
- Both net debt and operating profit[5]	18
= Final sample	114

We used Kommuneprofilen[6] to find the data we could not find in KOSTRA. We then compared the data we collated in this database with the annual accounts of the specific municipalities to be sure that the numbers were similar. In addition, we gathered all population data from 2006 from Kommuneprofilen as they did not exist in KOSTRA.

[3] Municipalities with net operating profit as a percentage of gross operating revenues of less than 1.5%.
[4] Municipalities with net debt per capita below average are excluded, but the municipalities with a higher net operating profit as a percentage of gross operating revenues of 2,8% (the country average for the period) and a lower net debt per capita than 12 000 are included. In addition, all municipalities with more than 6% in net operating profit as a percentage of gross operating revenues are included regardless of their net debt per capita.
[5] Municipalities which do not meet our requirements for either of our two key figures.
[6] «Kommuneprofilen» (2019) provides statistics and key figures for Norwegian municipalities and county municipalities.

4.3 Measurement of earnings management

This study focuses on accrual-based earnings management. Accruals are used as a measure of managers discretion in accounting as they are prone to opportunistic behavior (Cohen and Malkogianni, 2017).

Consistent with previous earnings management studies (Healy 1985; Jones 1991) Dechow et al. (1995) states that total accruals are computed as:

(1) $TACC_{it} = (\Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta STD_{it} - Dep_{it})$

Where:

ΔCA_{it} = change in current assets for municipality i in year t

ΔCL_{it} = change in current liabilities for municipality i in year t

$\Delta Cash_{it}$ = change in current cash equivalents for municipality i in year t

ΔSTD_{it} = change in debt included in current liabilities for municipality i in year t. In our case ΔSTD is overdraft and other short-term debt.

Dep_{it} = depreciation expense for municipality in year t

Total accruals consist of discretionary accruals and non-discretionary accruals. Discretionary accruals reflect changes in earnings that come from a manager's discretionary choice of accounting options, while non-discretionary accruals reflect changes in earnings that result from regular activity (Ferreira et al., 2013). An estimate of the discretionary component of total accruals is used as the measure of earnings management rather than the discretionary component of a single accrual (Jones, 1991).

The most cited model in earnings management literature is the aggregate Jones (1991) model. The model defines the discretion on accruals as the linear relation between total accruals, change in revenues and the property, plant and equipment (McNichols, 2000). We have chosen to use the balance sheet approach to the Jones model, as municipalities do not have a cashflow statement. The Jones model is usually scaled on total asset to control for differences in size. Beck (2018) departs from previous research by scaling all variables by population rather than total assets. Beck explains this choice with different reasons. She states that governmental accounting research typically uses population as a proxy for government size. Another argument is that population is a more appropriate proxy for unobservable forces that drive governmental revenues and expenses, in the same way as assets are an appropriate

measure for these forces in the corporate setting. Since our study is focused on municipalities, we decided to scale our Jones model on population. The reason why we scale is to control our model for heteroscedasticity and to ensure an accurate comparison of parameters (White, 1980).

To choose which method (fixed effects, random effects, pooled OLS) we should use for our panel data, we started out with doing a Hausman test for our control group to choose between fixed effects and random effects. The Hausman test were insignificant, which favor the random effects method. We then had to choose between random and pooled OLS by doing a Breusch-Pagan test. The Breuch-Pagan test were also insignificant, and consequently we chose to use the pooled OLS regression model. We were unable to complete the Hausman test for the Robek group, but we did a Breuch-Pagan test to choose between random effects and pooled OLS. The test was insignificant, and therefore we chose to use a pooled OLS regression model for the Robek group aswell.

To estimate discretionary accruals, we used this pooled OLS regression model of aggregate Jones (1991):

$$(2)\ \frac{TACC_{it}}{Population_{it-1}} = \beta_0 \frac{1}{Population_{it-1}} + \beta_1 \frac{\Delta REV_{it}}{Population_{it-1}} + \beta_2 \frac{PPE_{it}}{Population_{it-1}} + \varepsilon_{it}$$

Variable definitions:
$TACC_{it}$ = total accruals, computed as shown (Dechow et al. 1995), deflated by lagged population for municipality i in year t
$Population_{it-1}$ = lagged population for municipality i in year t-1
ΔREV_{it} = change in total sales deflated by lagged population for municipality i in year t
PPE_{it} = net value of property, plant and equipment deflated by lagged population for municipality i in year t

In addition to the Jones model, we have also estimated discretionary accruals using this pooled OLS regression model of the modified Jones model (Dechow et al., 1995):

$$(3)\ \frac{TACC_{it}}{Population_{it-1}} = \beta_0 \frac{1}{Population_{it-1}} + \beta_1 \frac{\Delta REV_{it} - \Delta REC_{it}}{Population_{it-1}} + \beta_2 \frac{PPE_{it}}{Population_{it-1}} + \varepsilon_{it}$$

The modified Jones model contains the same variables as the Jones model with one exception: change in receivables.
ΔREC_{it} = change in accounts receivable for municipality i in year t.

This model controls for earnings management due to abnormal increases in income, assuming all change in credit services are due to earnings management (Pellicer et al., 2013). We have chosen to scale all variables in the modified Jones model by population and we still used the balance sheet approach.

The dependent variable in equation 2 and 3 is an estimate of actual accruals and the different terms of the equations are parameters from the accounts that give the accruals estimate. The residual in these equations are the component of interest in our study, as it represents discretionary or abnormal accruals which is an estimate of earnings management (Misje and Kosberg, 2018).

In both Jones and modified Jones, we used the OLS method in order to estimate the parameters (β_0, β_1 and β_2) with the goal of minimizing the sum of the squares of the differences between the observed values in the dataset and those predicted by the linear function. Using the estimated parameters (β_0, β_1 and β_2) for each municipality and year, we could estimate the non-discretionary accruals (NDA_{it}) (Cohen and Malkogianni, 2017).

Jones (1991):

$$NDA_{it} = \beta_0 + \beta_1 \frac{\Delta REV_{it}}{Population_{it-1}} + \beta_2 \frac{\Delta PPE_{it}}{Population_{it-1}}$$

Modified jones (Dechow et al., 1995):

$$NDA_{it} = \beta_0 + \beta_1 \frac{\Delta REV_{it} - \Delta Rec_{it}}{Population_{it-1}} + \beta_2 \frac{\Delta PPE_{it}}{Population_{it-1}}$$

To find the value of discretionary accruals ($DACC_{it}$) we deduct the non-discretionary accruals from total accruals:

(4) $$DACC_{it} = \frac{TACC_{it}}{Population_{it-1}} - NDA_{it}$$

5. Empirical findings

In this section we present the results of our study. In order to identify the existence of earnings management in Norwegian municipalities, we have estimated discretionary accruals with the aggregate Jones model and the modified Jones model (Jones, 1991; Dechow et al., 1995). Modified Jones gave us the best model with the strongest adjusted coefficient of determination, and we have chosen to focus mainly on our results from this model. Firstly, we present the modified Jones model for both the control group and the Robek group, but our focus will be on the discretionary accruals since these are the most relevant findings for our hypotheses. The Jones models are presented in the appendix.

5.1 Results hypothesis 1

With our first hypothesis we aim to investigate whether municipalities delisting from Robek use more earnings management than a control group with municipalities not on the Robek list. To test our first hypothesis, we estimate equation 3, as presented in the methodology section, for both the control group and the Robek group. The results are presented in table 2.

Table 2: Modified Jones model for the control group and the Robek group

	Control group			*Robek group*		
	Coefficient	Std. error	P-value	Coefficient	Std. error	P-value
Constant	1152.482	360.935	0.001	1979.554	597.154	0.001
Term 1	2017856	413407.8	0.000	1066596	842549.8	0.208
Term 2	-0.492	0.031	0.000	-0.205	0.075	0.007
Term 3	-0.027	0.003	0.000	-0.041	0.007	0.000
No. of obs.	1254			129		
R^2 adjusted	0.228			0.253		
F statistic	124.54*			15.48*		

Notes: This table shows the results of equation (3) for our sample of 114 municipalities in the control group and 129 municipalities in the Robek group. *Significance level at 1 percent.

Term 1: $\beta_0 \frac{1}{Population_{it-1}}$ Term 2: $\beta_1 \frac{\Delta REV_{it} - \Delta REC_{it}}{Population_{it-1}}$ Term 3: $\beta_2 \frac{PPE_{it}}{Population_{it-1}}$

Table 2 reports the regression results for the modified Jones model for the control group and the Robek group. In the control group model the coefficients and the constant are all significant at a 1% level. The adjusted coefficient of determination is 0.228, which is a

satisfying coefficient of determination when using the modified Jones model (Jones, 1991). Jones (1991) had an average adjusted coefficient of determination of 0.232. In the Robek group model, all the coefficients have the same sign as for the control group. All the variables are significant at a 1% level, except from the first coefficient. The adjusted coefficient of determination for the Robek model is 0.253. This means that both our models estimated with the modified Jones method are solid models.

We have completed tests for multicollinearity, autocorrelation and heteroscedasticity which is presented in the appendix, regarding the control group model and Robek group model. The results testing for heteroscedasticity do not indicate a problem with heteroscedasticity for both our models. All values in the Pearson correlation is below 0.50 for both models except between term 1 and term 3 in the control group model. This indicates that there are no problems with multicollinearity in our models. The results from the VIF tests supports the impression from the Pearson correlation. Finally, we tested for autocorrelation using the Wooldridge test for autocorrelation in panel data. We were only able use this test for the control group, because of the structure of our data. The test does not indicate problems with autocorrelation for the control group model.

Regarding the Jones model (Table A2) the adjusted coefficient of determination is 0.07 for the control group model and 0.235 for the Robek group model, both lower than the modified Jones model. In the control group model, the first and the third coefficient are significant at a 5% level, but the second coefficient and the constant are not. The second and third coefficient are significant in the Robek group model, while the constant and the first coefficient are not.

Thereafter, we used equation 3 to calculate the discretionary accruals (equation 4) for both the control group and the Robek group. Table 3 shows the absolute value of the discretionary accruals for the control group and the Robek group the year they are delisted. We are using the absolute value of the discretionary accruals to be able to compare the degree of earnings management activities between the two groups. The mean values represent the average number of earnings management per capita for the two groups. Our results do not tell us anything about the kind of earnings management activity, such as whether it is income-increasing or income-decreasing.

Table 3: Absolute discretionary accruals for the control group and the Robek group

Variable	Obs	Mean	Std. Dev.	Min	Max
$\|DACC_{i,t}\|$ Control group	1254	3424.186	7432.826	1.946	109930
$\|DACC_{i,t}\|$ Robek group	129	1632.986	1553.295	1.559	9093.28

Notes: This table shows the number of absolute discretionary accruals for the two groups.

We did a Levene's test to find out whether we could assume equal or unequal variances between our groups (Schultz, 1985). Table A11, presented in the appendix, shows the results for the Levene's test and the t-test. The results tell us that we needed to assume unequal variances for the unpaired t-test since the p-values is below 0.05. The t-test testing for differences in mean between the control group and the Robek group, regarding the absolute value of the discretionary accruals, turned out to be significant at a 1 percent level. Our findings do provide evidence that the absolute value of discretionary accruals ($|DACC_{i,t}|$) is higher for the control group (3424.186) than for the Robek group (1632.986). This suggests that there is a higher earnings management activity for the control group compared to the year municipalities leave the Robek list. This does not correspond with previous studies and with our hypothesis, as we expected the contrary. For example, Cohen and Malkogianni (2017) finds that the likelihood that municipalities will engage in earnings management activities is greater when the financial performance of the municipalities is poor. Our results suggest the opposite.

There are several possible explanations for why our first hypothesis is failing. As we mentioned in the hypothesis's development, Hopland's (2014) findings about the effects on vote shares and reelection probability can be viewed as incentives for politicians to use earnings management to leave the Register. On the other hand, it can also be viewed as an incentive for politicians to use earnings management to stay away from the Register. This is a possible reason for why the control group has a higher level of earnings management in our results. This being said, we picked out our control group carefully to try to avoid municipalities close to being listed on Robek. The control group also has fewer restrictions and is under less monitoring compared to the Robek group; thus, the control group might also have a stronger opportunity to use more earnings management (Haraldsvik et al., 2018). Moreover, several studies show that the municipalities have clear incentives to manipulate their result close to zero (e.g. Ferreira et al., 2013). Consequently, the solid municipalities

included in our control group might use a high level of income-decreasing earnings management, and in this way their performance appears better, as supported by the findings of Lunder and Jenssen (2017). This is because high earnings in local governments is not considered as a sign of good performance (e.g. Verbruggen and Christiaens, 2012).

5.2 Results hypothesis 2 and 3

To test for our second and third hypothesis, we analyzed the difference in DACC for the Robek group the year before leaving Robek, the year delisting from Robek and the year after leaving Robek. Table 4 shows the differences in the average number of discretionary accruals. As with the first hypothesis, our results do not tell us whether it is used income-increasing or income-decreasing earnings management.

Table 4: Average number of discretionary accruals the year before leaving Robek, the year delisting from Robek and the year after leaving Robek

Variable	Obs.	Mean	Std. Dev.	Min	Max
$DACC_{t-1}$	129	-536.474	9769.351	-106325.1	12700.53
$DACC_{t}$	129	603.309	2366.775	-5748.253	9375.462
$DACC_{t+1}$	116	-74.326	2529.767	-7514.877	10834.56

The descriptive statistics in table 4 shows that the average number of the discretionary accruals is higher in the year the municipalities are leaving Robek (603.3), compared to the year before (-536.5) and the year after leaving Robek (-74.3). The results support the second and third hypotheses. This indicates that the municipalities in the Robek Register are using earnings management activities to delist from the Register.

We wanted to test the validity and the strength of our findings related to the second and third hypothesis. Therefore, we chose to do a t-test for these two hypotheses. The results of the tests are presented in Table A12 in the appendix. The Levene's test tells us that we needed to assume equal variances between the groups because the p-values are higher than 0.05 (Schultz, 1985). The differences in mean discretionary accruals between the year delisting from Robek and the year after leaving Robek is significantly different at a 5% level. This result corresponds with the findings we expected for our third hypothesis and validates our descriptive statistics in Table 4. Our descriptive results also support our second hypothesis,

finding that the number of discretionary accruals is higher for the municipalities the year they delist than the year before leaving Robek, but this result is not statistically significant at a 5% level with a p-value of 0.199.

There could be several possible reasons explaining why the size of discretionary accruals is not significantly different for the year municipalities delist from Robek, and the year before they are delisting from the Register. Especially, it may be a naive assumption to think that municipalities engage in earnings management activities only in the year they delist from the Register. If earnings management is used to delist from Robek, there is a likelihood that they have started to do it at an earlier stage than the year they delist.

The results for hypotheses two and three are consistent with findings from research drawing on an agency theory approach. The agents find incentives for earnings management in order to give the best view of their performance for reasons such as professional prestige and job maintenance (Beattie, 2002). Ferreira et al. (2013) notes that the local politicians use earnings management to demonstrate that the public resources are managed according to economic and efficiency principles. Lunder and Jenssen's findings suggest that local politicians are willing to go as far as breaking regulations to delist from Robek. According to the study of Buchanan and Tullock (1962) and the self-interest axiom (Boyne, 1997), we can assume that politicians have selfish motives and are motivated by the prospect of maximizing votes. This can be related to the findings of Hopland (2014) which states that entering Robek has a negative effect for the incumbent political party. Hence, we expected that delisting from Robek had the opposite effect.

Since the results for the second hypothesis are not statistically significant, we cannot claim that this hypothesis is true. With a p-value of 0.19, it is a higher possibility for the hypothesis being true than false. Taking this into consideration with the support in previous research, it is likely that the second hypothesis is true. The results for the third hypothesis are as expected and significant at a 5% level. Taking both the second and third hypothesis into account, it looks like getting rid of a signal indicating poor fiscal performance, such as Robek, is an incentive sufficiently strong to resort to a greater extent of earnings management.

6. Conclusion

Our main aim with this study was to examine whether Norwegian municipalities engage in earnings management activities in order to delist from the Robek Register. Through statistical analysis, we find more earnings management for the control group than the Robek group. Moreover, we find evidence indicating that municipalities included in Robek have either less income-decreasing or more income-increasing earnings management in the year they leave Robek compared to the year before and the year after delisting.

We believe that the contribution of our study to the earnings management literature is two-fold. First and foremost, through our empirical findings we contribute to closing a gap in the research on earnings management in the public sector. Increased knowledge about earnings management in the municipal sector could help regulatory bodies to develop standards more suitable for the public sector and prevent future politicians and managers from behaving in their own interest as opposed to the public's, which could jeopardize future sustainability. Secondly, to the best of our knowledge, this is the first study to connect earnings management in the municipal sector to a signal indicating poor fiscal performance, such as Robek. Research about Robek is important because the consequences interfere with the local democracy since freedom is diminished for municipalities under administration (Løvslett, 2014).

Our main contribution pertains to the second and third hypotheses. Our findings suggest that municipalities included in the Robek Register use earnings management to delist from the Register. This is because the municipalities have a higher level of income-increasing or a lower level of income-decreasing earnings management the year they delist from Robek compared to the previous year and the year after leaving the Register. Interestingly, the results of our first hypothesis are opposite from what we expected. These results indicate a higher level of earnings management for the control group than the Robek group. As already mentioned there exist several possible reasons for this: the control group is under fewer restrictions (Haraldsvik et al., 2018), they may have a higher opportunity for using earnings management (Stalebrink and Sacco, 2007; Haraldsvik et al., 2018) they have different incentives to avoid being listed on Robek (e.g. Hopland, 2014; Pellicer et al., 2013; Verbruggen and Christaens, 2012), and they may use earnings management in the opposite direction than the Robek group (e.g. Ferreira et al., 2013; Lunder and Jenssen, 2017). Even

though the result for our second hypothesis is not statistically significant, our findings point in the direction that a signal indicating poor fiscal performance, such as Robek, influences earnings management behaviour in the municipal sector.

Our study has valuable implications for policymaking in the public sector. It provides evidence that Norwegian municipalities employ earnings management actions in order to delist from Robek. This suggests that it might be reasonable with a closer follow-up of the municipalities on Robek. In a previous study, County Governors were in agreement that there should be a closer follow-up of the municipalities after leaving Robek (Haraldsvik et al., 2018). In addition, we also found a higher use of earnings management for the control group, which on the other hand indicates a need for a closer follow-up of municipalities outside the Robek Register. This leads us to question if the Robek Register has the appropriate disciplinary effect and if it is suited to control and monitor the economy of Norwegian municipalities. It is important to point out that this study does not provide conclusive evidence of Robek being unable to fulfill its task as a controlling monitor for the economy of Norwegian municipalities.

Like any other empirical research, our study is not without certain limitations. By using the Jones and the modified Jones model, we rely on proxy measures for earnings management. This means that we do not know if our results are subject to more natural explanations, rather than earnings management (Misje and Kosberg, 2018). It is possible that the municipality economy has improved the last decade, leading to a decrease in municipalities included in Robek. In addition, our findings do not tell us whether it is used income-decreasing or income-increasing earnings management. Intuition and earlier research tell us that the control group most likely uses more income-decreasing earnings management, while the Robek group uses more income-increasing (e.g. Ferreira et al., 2013; Lunder and Jenssen, 2017). However, we leave this for further studies. Moreover, the relatively small sample size may affect our results, therefore, the results from our analyses should be treated with caution. Finally, the inclusion of the seven municipalities involved in the Terra Securities scandal and the missing data for 2005 might influence our results. Despite the limitations, our work could be a springboard for further research about earnings management in the public sector.

Our study expands the research agenda and knowledge on earnings management in the public sector. Possible further developments of our study could include investigating if Norwegian

municipalities use earnings management activities proactively to avoid the Robek Register. In addition, studying whether there have been any changes in the degree of earnings management activities related to Robek over time would be interesting. For example, whether the financial crises in 2008 affected the earnings management behaviour in municipalities. Another angle is to study whether the municipalities, after delisting from Robek, continue to use earnings management to stay away from the Register. It would also be interesting to examine if other factors such as political factors influence the earnings management activities. Finally, it would be possible for future researchers to do a similar study as Hopland (2014), testing whether delisting from Robek has a positive signal effect and affects the vote shares and reelection probability.

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Appendix

Table A1: Definitions of the variables applied

ΔCA_{it} = change in current assets for municipality i in year t

ΔCL_{it} = change in current liabilities for municipality i in year t

$\Delta Cash_{it}$ = change in current cash equivalents for municipality i in year t

ΔSTD_{it} = change in debt included in current liabilities for municipality i in year t. In our case ΔSTD is overdraft and other short-term debt

Dep_{it} = depreciation expense for municipality i in year t

$TACC_{it}$ = total accruals for municipality i in year t

$Population_{it-1}$ = lagged population for municipality i in year t

ΔREV_{it} = change in total sales for municipality i in year t

ΔPPE_{it} = change in net value of property, plant and equipment for municipality i in year t

ΔREC_{it} = change in accounts receivable for municipality i in year t

$DACC_{it}$ = discretionary accruals for municipality i in year t

NDA_{it} = nondiscretionary accruals for municipality i in year t

Table A2: Jones model for the control group and the Robek group

	Control group			*Robek group*		
	Coefficient	Std. error	P-value	Coefficient	Std. error	P-value
Constant	-505.106	406.747	0.215	710.738	658.33	0.282
Term 1	1814630	450228.1	0.000	-150996.5	892172.6	0.866
Term 2	0.082	0.046	0.079	0.189	0.081	0.022
Term 3	-0.032	0.003	0.000	-0.04	0.007	0.000
No. of obs.	1254			129		
R^2 adjusted	0.07			0.235		
F statistic	32.41*			14.08*		

Notes: This table shows the results of equation (2) for our sample of 114 municipalities in the control group and 129 municipalities in the Robek group. *Significance level at 1 per cent. Term 1: $\beta_0 \frac{1}{Population_{it-1}}$ Term 2: $\beta_1 \frac{\Delta REV_{it}}{Population_{it-1}}$ Term 3: $\beta_2 \frac{PPE_{it}}{Population_{it-1}}$

Table A3: Hausman test Modified Jones (1995) model for the control group model

Prob > chi2	0.0998

Notes: Test of H_0: difference in coefficients not systematic. The random effects estimator is chosen if the p-value is > 0.05.

Table A4: Breusch-Pagan/Cook-Weisberg test for heteroskedasticity for the control group

H0: Constant variance

Variables: fitted values of scaled_TACC

Chi2 (1) = 3.04

Prob > chi2 = 0.08

Notes: The Breusch-Pagan test is used to test for heteroskedasticity in the error term by investigating whether the squared residuals can be explained by possible proportionality factors. The null hypothesis is homoskedasticity, and a significant value means that there is presence of heteroskedasticity (Breusch & Pagan, 1979; Cook & Weisberg, 1983). Test of H_0: constant variance. A value below 0.05 indicates heteroskedasticity. The pooled OLS is chosen if the p-value is > 0.05.

Table A5: Breusch-Pagan/Cook-Weisberg test for heteroskedasticity for the Robek group

H0: Constant variance

Variables: fitted values of scaled_TACC

Chi2 (1) = 0.23

Prob > chi2 = 0.63

Notes: The Breusch-Pagan test is used to test for heteroskedasticity in the error term by investigating whether the squared residuals can be explained by possible proportionality factors. The null hypothesis is homoskedasticity, and a significant value means that there is presence of heteroskedasticity (Breusch & Pagan, 1979; Cook & Weisberg, 1983). Test of H_0: constant variance. A value below 0.05 indicates heteroskedasticity. The pooled OLS is chosen if the p-value is > 0.05.

Table A6: VIF test for the control group

Variable	VIF	1/VIF
Term 3	1.44	0.695
Term 1	1.42	0.705
Term 2	1.02	0.977
Mean VIF	1.29	

Notes: A high VIF indicates that multicollinearity has increased the estimated variance of the estimated coefficient, yielding a decreased t-score. While there is no table of formal critical VIF values, a common rule of thumb is that if VIF (β_1) > 5, the multicollinearity is severe (Studenmund, 2017).

Table A7: VIF test for the Robek group

Variable	VIF	1/VIF
Term 1	1.32	0.758
Term 3	1.25	0.798
Term 2	1.07	0.935
Mean VIF	1.21	

Notes: A high VIF indicates that multicollinearity has increased the estimated variance of the estimated coefficient, yielding a decreased t-score. While there is no table of formal critical VIF values, a common rule of thumb is that if VIF (β_1) > 5, the multicollinearity is severe (Studenmund, 2017).

Table A8: Pearson correlation for the control group

	Dep. variable	Term 1	Term 2	Term 3
Dep.variable	1.0000			
Term 1	-0.0402	1.0000		
Term 2	-0.4236	0.0955	1.0000	
Term 3	-0.2517	0.5429	0.1514	1.0000

Notes: In the research literature there exist a dissagreement of what is considered a high and a low correlation. According to Johannesen (2009) a correlation coefficient above 0.5 is considered a strong correlation. Studendmund (2017) writes that some researchers uses a correlation coefficient above 0.8 as high correlation, while Pallant (2010) states that values above 0.9 indicates potential problems with multicollinearity.

Table A9: Pearson correlation for the Robek group

	Dep. variable	Term 1	Term 2	Term 3
Dep. variable	1.0000			
Term 1	-0.1671	1.0000		
Term 2	-0.2502	0.2546	1.0000	
Term 3	-0.4742	0.4494	0.1265	1.0000

Notes: In the research literature there exist a dissagreement of what is considered a high and a low correlation. According to Johannesen (2009) a correlation coefficient above 0.5 is considered a strong correlation. Studendmund (2017) writes that some researchers uses a correlation coefficient above 0.8 as high correlation, while Pallant (2010) states that values above 0.9 indicates potential problems with multicollinearity.

Table A10: Wooldridge test for panel-level autocorrelation for the control group

H0:	no first-order autocorrelation	
F (1, 113)	=	0.214
Prob > F	=	0.644

Notes: Test for H_0: no first-order autocorrelation. A significant test statistic indicates the presence of serial correlation (Wooldridge, 2010; Drukker, 2003). No autocorrelation if the p-value is > 0.05.

Table A11: Levene's test and unpaired t-test for unequal variances for hypothesis 1

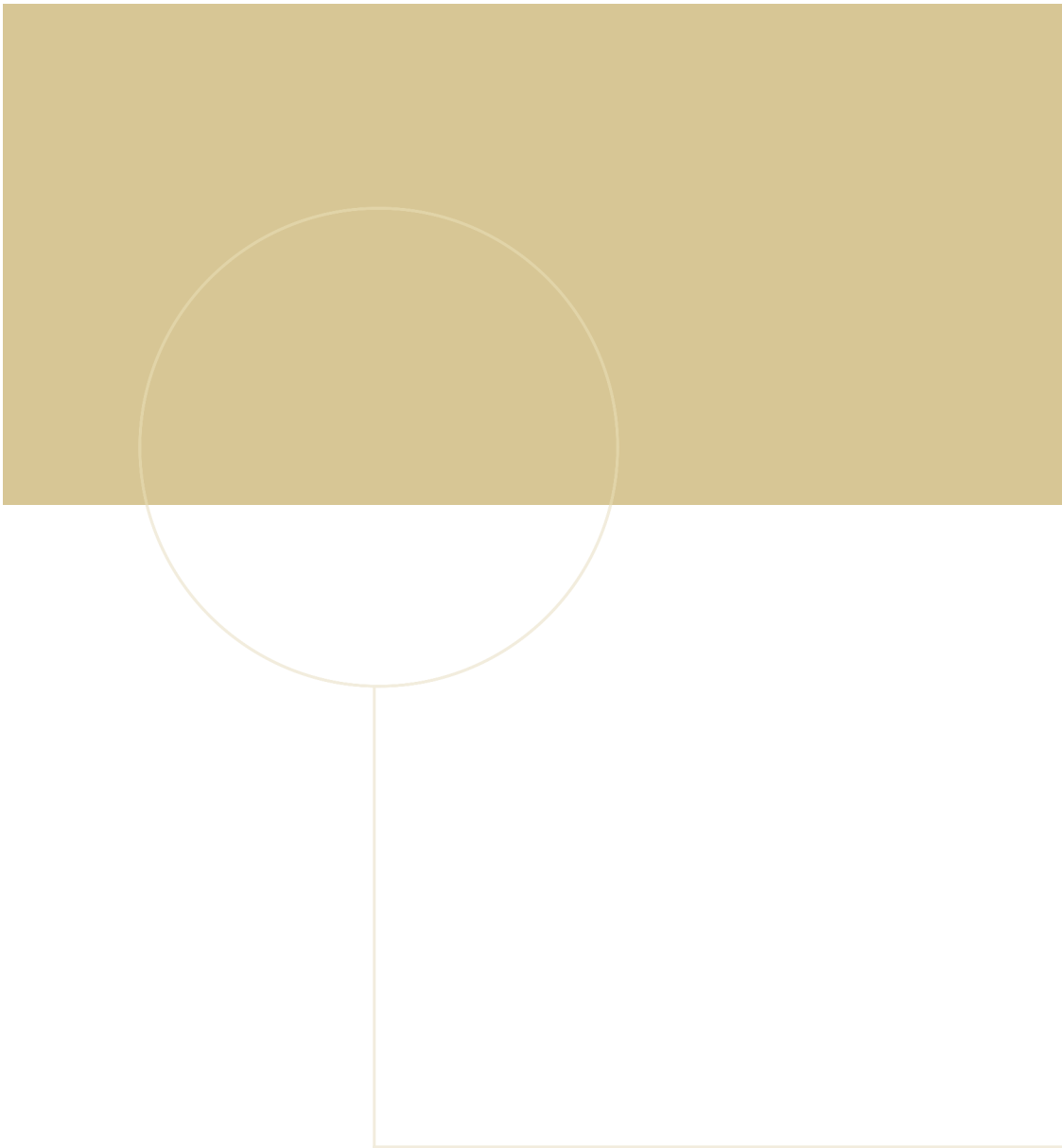
Time	Mean	Std. Dev.	Freq.
1	3424.186	7432.826	1254
2	1632.986	1553.296	129
W0 = 12.941	df(1, 1381)	Pr > F = 0.000	
W50 = 6.773	df(1, 1381)	Pr > F = 0.009	
W10 = 7.222	df(1, 1381)	Pr > F = 0.007	
Unpaired t-test with unequal variances:			
T-value = 7.15*	P-value = 0.000		

Notes: W0 uses the mean, W50 uses the median, and W10 uses the trimmed mean: top and bottom 10% are taken out before computing (Schultz, 1985). *Significance level at 1 percent.

Table A12: Levene's test and unpaired t-test for unequal variances for hypotheses 2 and 3

Time	Mean	Std. Dev.	Freq.
1	-536.473	9769.351	129
2	603.310	2366.754	129
3	-74.326	2529.768	116
W0 = 12.941	df(2, 371)	Pr > F = 0.234	
W50 = 6.773	df(2, 371)	Pr > F = 0.331	
W10 = 7.222	df(2, 371)	Pr > F = 0.335	
Unpaired t-test with equal variances**:**			
$DACC_{t-1}$ and $DACC_t$	T-value = -1.288	P-value = 0.199	
$DACC_t$ and $DACC_{t+1}$	T-value = 2.166**	P-value = 0.031	

Notes: $DACC_{t-1}$ = the year before leaving Robek. $DACC_t$ = the year delisting from Robek. $DACC_{t+1}$ = the year after leaving Robek. **Significance level at 5 percent.



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