Earnings management in commercial banks from the perspective of the Dodd-Frank Act

ERASMUS UNIVERSITY ROTTERDAM
Erasmus School of Economics

Master Thesis Accounting, Auditing & Control
Track: Accounting & Auditing

Manon Verheij (450300)
16 June 2020

Supervisor: Dr. Ying Gan
Second assessor: Dr. Michael H. R. Erkens

ABSTRACT

I analyse the level of earnings management in commercial banks before and after the enactment of the Dodd-Frank Act for the period 2000-2017 to assess if banks engage in less earnings management following increased regulation. I find that discretionary loan loss provisions are significantly lower following the passage of the Dodd-Frank Act. This suggests that the increase in external monitoring resulting from the implementation of the Dodd-Frank Act leads to less earnings management. I find suggestive evidence that (1) regional and large banks, (2) banks closer to violating the capital requirements, and (3) banks with institutional investors with lower shareholdings experience a stronger reduction in earnings management following the Dodd-Frank Act. I do not document such a reaction for banks with a Big 4 auditor. I do find, however, that banks with a higher capital ratio and banks with institutional investors with large shareholdings engage in less earnings management. Better capitalization and monitoring of institutional investors with large shareholdings may act as substitutes for the monitoring of Big 4 auditors. Regulators should consider the possible adverse effect on earnings management when rolling back provisions of the Dodd-Frank Act.

Keywords: Dodd-Frank Act, earnings management, external monitoring, commercial banks

Table of Contents

1. Introduction

On July 21, 2010 the Dodd-Frank Wall Street Reform and Consumer Protection Act[1] (hereafter Dodd-Frank Act or DFA) was enacted in the United States. The Dodd-Frank Act imposes increased supervision, regulation and monitoring on the financial industry. The main goal of the DFA is to enhance the financial stability of the financial market. The regulatory requirements and oversight are more rigorous for regional banks (assets between $10 and $50 billion) and large banks (assets above $50 billion), than for small banks (assets less than $10 billion). Larger banks form a bigger threat for the financial stability of the country (U.S. Congress 2010). The DFA increases monitoring of banks by regulators and other stakeholders to see how the banks comply and what the consequences of the DFA are. The regulatory disclosure requirements of the DFA lead to more insights in how the banks perform. This results in more transparency and less information asymmetry. The disclosure of information facilitates both regulators, the market and other stakeholders to monitor and discipline the banks on excessive risk-taking. The increase in external monitoring can reduce incentives for bank managers to behave opportunistic. This research examines the level of earnings management before and after the enactment of the Dodd-Frank Act to answer the following research question:

***RQ**: "Do banks engage in less earnings management following increased regulation?"*

Previous literature find that European bank managers engage in less earnings management after the implementation of the accounting standards IFRS. The reason for that is the enhanced transparency of financial information which enables monitoring by stakeholders (Leventis et al. 2011). Other studies show that banks in countries with more powerful bank regulation and monitoring in general exhibit less earnings management (Fonseca and González 2008; Dal Maso et al. 2018). On the contrary, I focus on the implementation of specific banking regulation in the United States, the Dodd-Frank Act, and its effect on earnings management. This event is an exogenous shock in the level of regulation and monitoring.

This research also relates to recent developments concerning the Dodd-Frank Act. On May 24, 2018 President Trump of the United States signed into law a bill[2] that loosens the

[1] Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, Pub.L. 111-203, 124 Stat. 1376, enacted July 21, 2010. If I refer to a section of this Act, such as section 115, I use the following notation: DFA 115.

[2] Economic Growth, Regulatory Relief, and Consumer Protection Act of 2018, Pub.L. 115-174, 132 Stat. 1296, enacted May 24, 2018

regulatory requirements of the DFA. The $50 billion asset threshold is increased to $250 billion; this will reduce the banks that are subject to more regulatory scrutiny (U.S. Congress 2018). This research gives regulators, policy makers and investors insights in the consequences of the DFA that a rollback will possibly undo.

I analyse the level of earnings management of 1,120 listed U.S. commercial banks before and after the enactment of the DFA for the period 2000-2017, to test if banks engage in less earnings management following increased regulation. I use the absolute value of abnormal loan loss provisions as a measure of earnings management. I examine if the Dodd-Frank effect varies for different levels of regulation and monitoring, because this influences the incentives for earnings management. Therefore, I differentiate between types and characteristics of the banks with the help of indicator variables. For example, I compare large and regional banks with small banks. Subsequently, I look into the influence of the capital requirements and different monitoring parties on earnings management. I do that by distinguishing between banks with a high and low capital ratio, banks with a Big 4 auditor and non-Big 4 auditor and banks with institutional investors with large or low shareholdings.

For the sample period 2000-2017, I find that discretionary loan loss provisions are significantly lower following the passage of the Dodd-Frank Act, and that this result also holds for banks that are close to violating the capital requirements. Furthermore, I find that this reduction is more pronounced for regional and large banks. Moreover, discretionary loan loss provisions are significantly lower for banks with a higher capital ratio and monitoring of institutional investors with large shareholdings. I do not find evidence that Big 4 auditors restrict earnings management. However, inconsistent with my predictions, neither the external monitoring of Big 4 auditors nor institutional investors with large shareholdings pronounce the reduction in discretionary loan loss provisions following the Dodd-Frank Act.

I perform additional robustness tests, which provide some contradicting results. The finding that the reduction in earnings management is stronger for regional and large banks is not robust for excluding the financial crisis years (2007-2009) and the alternative measure income-increasing earnings management. Also, employing a continuous variable instead of a dummy variable for banks that are close to the minimum capital ratio, I find that the reduction in earnings management following the DFA is stronger for banks closer to violating the capital requirements. Besides, applying a continuous variable instead of a dummy variable and a higher cut-off point to classify institutional investors with large shareholdings, I find that the reduction in earnings management after the DFA is smaller for banks with institutional investors with

large shareholdings. And after controlling for the Heckman selection model, banks with a Big 4 auditor are associated with more earnings management.

In sum, I can conclude that banks engage in less earnings management following increased regulation. I contribute to the literature about the consequences of the DFA. Prior literature find that the financial stability and market discipline improved following the DFA (Balasubramnian and Cyree 2014; Balasubramanyan et al. 2019). I add to the literature by exploring an unintended consequence of the DFA on the accounting practice of bank managers.

I also contribute to the literature about capital management. Moyer (1990) shows that banks that are close to breaching the minimum capital requirements, manage loan loss provisions to avoid regulatory costs. I find that the additional monitoring as a result of the DFA leads to a reduction in earnings management for banks closer to violating the capital requirements. This gives policy makers or accounting regulators the insight that monitoring maybe reduces the misuse of loan loss provisions for managing capital.

My findings have some implications for bank regulators, policy makers and investors. I find that banks with a higher capital ratio and banks with institutional investors with large shareholdings engage in less earnings management, but I do not find that Big 4 auditors restrict earnings management. This finding gives a possible insight about the role of auditors. It can mean that better capitalization and the monitoring of institutional investors with large shareholdings may act as substitutes for the monitoring of Big 4 auditors. This research also gives an insight in the consequences of the Dodd-Frank Act. The aim of the Dodd-Frank Act is to enhance the financial stability of the financial market. Gao et al. (2018) find that the market doubts the effectiveness of the DFA. Both regulators and investors need to be aware that regulation can impose unintended consequences. Even though the DFA may not result in the intended desired effect (higher financial stability and lower risk-taking), it can lead to other possible desirable effects, like less opportunistic behavior of bank managers. Regulators need to be informed about that the use of thresholds for regulation can pose different implications for the affected banks. Besides, banks with different characteristics could react differently to regulation.

I organize the rest of this research as follows. Section 2 presents the theoretical framework. Section 3 develops the hypotheses, based on related prior literature. Section 4 describes the methodology, sample selection and data preparation. Section 5 presents the empirical findings. Section 6 concludes this research.

2. Theoretical background

Section 2.1 explains the difference between banks and nonfinancial firms. Section 2.2 explains the motivations for earnings management. Section 2.3 explains how external monitoring can affect earnings management. Section 2.4 provides the provisions of the Dodd-Frank Act that affect banks' incentives to engage in earnings management.

2.1 Banks vs. nonfinancial firms

There are two main types of banks: commercial and investment banks. Commercial banks use customer deposits to provide loans to firms and individuals. Investment banks provide underwriting and advisory services, manage assets and act as a trader or broker (Moutsianas and Kosmidou 2016). Because this research focuses on earnings management through loan loss provisions, I study commercial banks only.

Banks are differently structured than nonfinancial firms. First, banks have on average more debt in their capital structure (90%) than nonfinancial firms (40%) (Mehran et al. 2011).

Second, banks have more stakeholders than nonfinancial firms, such as the government and the deposit insurance authority. The government regulates banks because the failure of a bank can pose negative implications for the whole financial system. If the bank becomes insolvent, deposit holders are insured up to a certain amount by the Federal Deposit Insurance Corporation (FDIC). While regulators and debtholders prefer low volatility and a long-term perspective, shareholders may prefer some risk-taking (Mehran et al. 2011).

Third, banks' activities are more complex and harder to understand (Mehran et al. 2011). It is difficult for investors to value bank assets, as the true value of nonmarketable loans is unknown. This information asymmetry is one reason for bank regulation (Flannery et al. 2004).

Fourth, banks are more regulated than other industries. Banks must have enough capital to absorb losses to stay solvent in the case of financial distress. The capital ratio is generally defined as the ratio of equity to risk-weighted bank assets (Baily et al. 2017).

Fifth, loan loss provisions are the largest component of accruals in banks, while total accruals are important for nonfinancial firms (Beatty and Liao 2014). SFAS No. 114 deals with the recognition of loan loss provisions. When a bank lends money to a client, this loan is recognized as an asset. Loan loss reserves are a contra-asset item which decrease the value of the outstanding loans. The loan loss reserves reflect the amount the manager expects to lose because not all obligations will be repaid. The manager assesses periodically how much to add to the loan loss reserves. This provision for loan losses is recognized as an expense (Balla et al. 2012). Loan loss provisions reduce earnings and the capital ratio (Beatty and Liao 2014).

2.2 Earnings management

This section explains why managers engage in earnings management. Managers have inside knowledge of the firm and its business opportunities. They can choose reporting methods and estimates that best represents the firm's business reality. In this way, managers can use financial statements to signal private information of the firm performance to the capital market. This can enhance the communication value of financial reporting. For this reason, standards allow some possibility for exercising judgement in accounting. However, the possibility for managers to use discretion in financial reporting creates the opportunity for earnings management. This means that managers use judgement in financial reporting and in structuring transactions to adjust financial statements. One objective is to mislead stakeholders about the firm's underlying economic performance. Another objective is to influence contractual outcomes that are based on reported accounting numbers. As managers select reporting methods and estimates that do not appropriately reflect the firm's business reality, earnings management can decrease the credibility of financial reporting (Healy and Wahlen 1999).

Financial firms are always excluded in general earnings management studies as they have a different financial reporting environment and accrual process (Peasnell et al. 2000). Banks can manage earnings via the loan loss provisions account. These provisions are designed to reflect expected future losses on banks' loan portfolios. Because the estimation of these uncertain future losses is subjective, managers can use discretion to manipulate loan loss provisions (Anandarajan et al. 2003).

Mixed evidence exists regarding the assertion that banks engage in earnings management via their loan loss provisions. Among others, Ahmed et al. (1999) do not find evidence of earnings management via loan loss provisions. On the contrary, Collins et al. (1995) do find a positive relation between earnings and loan loss provisions. Incentives for earnings management include capital market motivations, contracting motivations and regulatory motivations.

Capital market motivations

Managers have incentives to manage earnings to influence short-term stock price performance. Accounting information is used for valuing stocks (Healy and Wahlen 1999). Managers believe that higher earnings will lead to higher stock prices. This contributes to higher compensation or a better reputation (Fields et al. 2001). Wahlen (1994) finds that the market perceives discretionary parts of unexpected loan loss provisions as good news about future changes in cash flows and earnings, although provisions reduce current earnings. This is not the case for

banks with abnormal low loan loss provisions. The market believes that these banks will have poor future cash flows and earnings. It is possible that investors suspect these banks of earnings management and hence discount performance. Beaver et al. (1989) find that normal changes in loan loss provisions, such as non-performing loans and write-offs, are negatively interpreted by the market. These normal changes reflect the underlying loan portfolio performance.

Contracting motivations

Managers have incentives to manage earnings because contracts are regularly based on accounting numbers. Managers select accounting methods to increase their compensation. Compensation contracts are often based on net income or stock performance. Managers also want to reduce the possibility of bond covenant violations. Bond covenants are often based on the debt to equity ratio, where equity includes retained earnings (Fields et al. 2001). Moyer (1990) assumes that bank managers are less likely to be influenced by compensation contracts and debt covenants.

Regulatory motivations

Managers have incentives to manage earnings to avoid industry-specific regulation. Banks must meet capital requirements that depend on accounting numbers. They face regulatory costs if the bank's capital adequacy ratio drops under the regulatory minimum (Healy and Wahlen 1999). Moyer (1990) shows that banks that are close to breaching the minimum capital requirements, manage loan loss provisions to avoid regulatory costs.

Kim and Kross (1998) study the effect of a regulatory change on banks' behavior. In 1989, the minimum capital requirement increased, and the calculation changed. Since 1990, the allowance for loan losses is excluded from regulatory capital. Accordingly, banks can underestimate loan loss provisions to increase income and regulatory capital. They find that banks with low capital ratios have lower loan loss provisions after the regulatory change than before, compared to banks with high capital ratios. This means that a change in banking regulation can change managers' behavior regarding loan loss provisions.

A more recent study by Bischof et al. (2019) shows that IFRS banks changed behavior as a response to regulatory capital restrictions following the financial crisis in 2008. Banks had the option to not recognize unrealized fair value losses by reclassifying financial assets. They find that banks reclassify financial assets to influence regulatory capital, instead of using loan loss provisions.

2.3 External monitoring

This section explains how monitoring can affect earnings management. The Dodd-Frank Act increased the level of regulation. Monitoring is one way of regulating banks. Regulators and other stakeholders want to see how the banks comply and what the consequences of the Dodd-Frank Act are. This increased external monitoring can lead to less incentives for managerial opportunistic behavior than before as bank managers are feeling more watched.

Monitoring of firms is necessary because of the agency problem. According to Healy and Palepu (2001), there is an agency problem because owners invest money in the firm, but they do not have a role as manager. Managers can have incentives to use the money for their own interest. Scott (2015) argues that information asymmetry drives this problem. Managers have better information about the firm's business reality and prospects than outside investors (adverse selection). Managers can use this information advantage for opportunistic behavior: they can bias or manage information provided to investors at their expense.

Strengthened governance, basically monitoring activities by information intermediaries, can reduce earnings management. Information intermediaries gather information to detect managers' behavior of misuse of money from the firm (Healy and Palepu 2001). Prior research showed that the consequences of discovery of earnings management are negative. There are negative market reactions (Palmrose et al. 2004) and there is a higher CEO turnover (Desai et al. 2006) following restatements.

Wongsunwai (2013) finds that external monitoring by high-quality venture capitalists of IPO companies reduces earnings management, reflected in lower abnormal accruals in the period after the termination of IPO lockups. Venture capitalist are intermediaries who combine capital from institutions and invest this in portfolio companies to make profit. In return they get a fee and a percentage of the profit. The results indicate that high-quality venture capitalists monitor the firms that are going public more than low-quality venture capitalists. Low-quality venture capitalists allow the firm more to report higher earnings, in order to get a higher financial gain for selling the shares. But high-quality venture capitalists are concerned that this behavior becomes public and therefore want to maintain their reputation.

Murphy (2013) states that the disclosure of information prevents costs to collect information. This facilitates better monitoring by shareholders, leading to less information asymmetry and agency problems. Irani and Oesch (2013) find that firms conduct more earnings management following an exogenous reduction in analyst coverage due to mergers from brokerage houses. This means that analysts monitor managers' behavior effectively. They also find that managers release less informative disclosures when this scrutiny is absent.

2.4 The Dodd-Frank Act

This section gives an insight into the banking regulation before the Dodd-Frank Act. The Banking Act in 1933 separated commercial banks from investment banks. Only investment banks were allowed to trade in securities. This provision was repealed during the 1990s. This deregulation resulted in large, interconnected and complex financial firms with both commercial and investment banking activities (Baily et al. 2017). The assets of banks doubled between 2004-2007, partly because of attractive subprime mortgages (Acharya and Richardson 2012). The assets of banks were much riskier than expected. The overvalued assets dropped in value when the house prices were declining, and borrowers defaulted on the loans (Ryan 2008; Baily et al. 2017). The financial firms had too much leverage and not enough capital to absorb the losses, therefore the government bailed out troubled banks at the expense of taxpayers (Acharya and Richardson 2012). Summarizing, the financial crisis is caused by excessive risk-taking activities of large and complex financial firms with risky and mispriced securities and derivate instruments (Ryan 2008).

Section 2.4.1 explains why the Dodd-Frank Act was implemented. Section 2.4.2 provides an overview of the provisions of the Dodd-Frank Act that affect all banks' incentives to engage in earnings management, whereas section 2.4.3 state the provisions that affect some banks' incentives to manage earnings. Lastly, section 2.4.4 state some of the consequences of the Dodd-Frank Act.

2.4.1 Introduction of the Dodd-Frank Act

On July 21, 2010 the Dodd-Frank Act was enacted in the United States as a response to the Great Recession of 2008. It was enacted to prevent another future financial crisis by imposing increased supervision and regulation on the financial industry (Koba 2013). The main purpose of the Dodd-Frank Act is to promote the financial stability of the United States. This is done by improving accountability and transparency in the financial system. Other purposes are to end 'too big to fail' or to protect consumers from offensive financial services practices (U.S. Congress 2010). The DFA is the biggest amendment to the financial sector regulation in the United States since The Banking Act in 1933, covering 225 new rules across 11 agencies (Acharya and Richardson 2012).

The aim of the DFA is to enhance the financial stability of the financial market by decreasing the systematic risk. Financial firms are systemically important if the material distress of a financial firm creates a threat to the financial stability of the country. This is the case when

the nature, scope, size, scale, concentration, interconnectedness, or mix of the activities increase the risk of severe liquidity or credit problems among financial firms in the market (DFA 803).

The DFA makes a distinction in regulation for banks based on asset size, assuming that larger banks have a greater impact on the financial stability. Banks with consolidated assets over $50 billion are classified as systemically important financial institutions (SIFIs). These banks are subject to the strictest requirements and oversight (DFA 115). I refer to these banks as large banks. Small banks with consolidated assets less than $10 billion face the least strict rules. Regional banks with consolidated assets between $10 and $50 billion have more oversight and requirements than small banks, but less than large banks (Bindal et al. 2020). All banks have more stringent requirements than before the Dodd-Frank Act (DFA 113; DFA 166).

The Dodd-Frank Act comes with increased compliance costs. This are the costs for banks to comply with new regulation. Examples are hiring suitable employees or bringing in outside compliance experts. Compliance costs decrease profitability and are more burdensome for small banks. They have less capacity for regulatory compliance than larger banks (Leledakis and Pyrgiotakis 2019). On the other hand, larger banks have additional compliance costs to adhere to certain mandatory disclosure requirements not applicable to small banks.

2.4.2 Provisions that affect banks' incentives to manage earnings

This section provides an overview of the DFA provisions that affect banks' incentives to manage earnings, among which are stricter regulatory rules, supervision and monitoring.

An example of the increased supervision is the creation of the Financial Stability Oversight Council (FSOC). The FSOC monitors the stability of the United States' financial system. The FSOC identifies risks, promotes market discipline and responds to emerging threats to the financial stability of the United States. A duty of the FSOC is to make recommendations to the Federal Reserve Board about higher risk-based capital requirements, leverage limits, liquidity requirements, resolution plans and enhanced public disclosures for financial firms. The FSOC can force a financial firm to submit reports to assess if the firm or its activities can pose a threat to the financial stability of the country. This increases transparency among the different stakeholders (DFA 112; Fein 2010). The FSOC monitors banks' risk-taking and promotes monitoring by players in the market, this increase in external monitoring can reduce banks' incentives to engage in earnings management.

An example of the increased regulation are the implementation of minimum leverage capital and risk-based capital requirements. The leverage capital requirement is the ratio of Tier 1 capital to average total assets. The risk-based capital requirement is the ratio of Tier 1 capital

to risk-weighted assets. These requirements shall not be less than the already applicable minimum requirements (DFA 171). Banks that are close to violating the capital requirements can have incentives to engage in earnings management to prevent sanctions. Managers can understate loan loss provisions to increase the capital ratio. For banks that hold excess capital, this capital is unavailable to invest in business opportunities. But it is not clear for these banks if higher capital requirements provide incentives for earnings management.

The DFA also established a whistleblower program. This program entails that whistleblowers, who voluntary reveal information that leads to a successful legal action, get a financial reward. They also get a costless lawsuit if they are fired by their employer (DFA 922). This higher protection level increases incentives for employees to uncover fraud or irregularities, while it reduces incentives for banks to engage in earnings management. Wiedman and Zhu (2018) investigate if the whistleblower program discourages aggressive financial reporting for U.S. companies. They find that abnormal accruals and the probability of fraud is lower following the implementation of the DFA. The same result is possible for banks.

2.4.3 Provisions that affect specific banks' incentives to manage earnings

As the DFA makes a distinction in regulation for banks based on asset size, this section provides provisions that only affect some banks' incentives to manage earnings. First, all regional and large banks must have a stand-alone risk committee, formed of independent members from the board of directors. In addition, large banks are required to appoint a chief risk officer. The purpose of the risk committees is to monitor risks at the board and management level (DFA 165; Balasubramanyan et al. 2019). The DFA stresses the importance of risk, therefore the risk committee monitors the bank's risk management. This increase in external monitoring can reduce banks' incentives to engage in earnings management.

Second, large banks have stricter capital, leverage, and liquidity requirements. They have a bigger impact on the financial stability in case of material financial distress (Gao et al. 2018). Large banks must have a debt-to-equity ratio of less than 15 to 1, or a leverage ratio of at least 6.5%. They also must include off-balance sheet activities in the computation of the capital requirements (DFA 165; Acharya and Richardson 2012; Pierret and Steri 2017). As mentioned before, banks that are close to violating the capital requirements can have incentives to engage in earnings management to prevent the associated regulatory costs.

Third, regional and large banks are subject to stress tests to assess if the banks have enough capital to incur losses in the event of adverse economic conditions. There are three possible scenarios: baseline, adverse, and severely adverse. The baseline scenario is a forecast

under normal market conditions. The two adverse scenarios are forecasts under potential stressed market conditions. The goal of the stress test is to see how the bank's balance sheet, risk-weighted assets, net income and hypothetical regulatory capital ratios would look like under the different scenarios. This shows how banks would perform during bad economic times. The regional banks are required to do annual, self-administered stress tests. For large banks these tests are semi-annual. Besides the stress tests performed by the bank, the regulator also performs an annual stress test for large banks. This is the Dodd-Frank Act Stress Test (DFAST), as part of the Comprehensive Capital Analysis and Review (CCAR). The large banks must submit capital plans. The regulator can then assess if the bank is able to maintain the minimum post-stress capital ratios after their intended capital issuances and distributions (dividend payments, share repurchases etc.) (DFA 165; Pierret and Steri 2017; Mason et al. 2018).

The results of all the stress tests are publicly disclosed, this reduces information asymmetry (DFA 165). The bank must adhere to the deadlines. The bank can have incentives to manage earnings prior to this deadline because the scenarios are based on the current accounting numbers. If the results of the stress tests are negative for the banks, the bank is not able to do any form of capital distribution until the next test. This brings bad attention to the bank. However, the stress tests lead to increased external monitoring which can reduce earnings management. Cortés et al. (2020) say that if the stress test forecast capital declines, banks have incentives to decrease their loan portfolio risk.

Lastly, large banks have additional disclosure requirements to prevent them of being 'too big to fail'. The banks are required to periodically report a resolution plan, also called living wills. This shows the strategy how the bank can be liquidated in a quick and orderly way in the case of material financial distress. This plan includes information about the banks' ownership structure, assets, liabilities and contractual obligations. It also includes information about how the bank is protected from risks from activities not related to banking. In addition, it includes a plan how the collateral can be split up (DFA 165). The living wills will prevent future bailouts from the government, because they can intervene in a timely way (Gao et al. 2018). Besides the living wills, the large banks are required to make a credit exposure report. This shows to which large banks and non-bank SIFIs the bank has credit exposure (DFA 165).

Healy and Palepu (2001) state that regulated financial reports provide new and relevant information to investors. According to Murphy (2013), disclosure of information leads to more transparency and facilitates monitoring by stakeholders. This leads to less information asymmetry and can lead to less earnings management.

2.4.4 Consequences of the Dodd-Frank Act

This section states some of the consequences of the Dodd-Frank Act. Balasubramanyan et al. (2019) find that banks take less risk activities following the passage of the law. This increases financial stability. Balasubramnian and Cyree (2014) document that market discipline on banks improved following the DFA. This means that players in the market monitor and discipline unreasonable risk-taking by banks on an increased basis following the DFA (Bushman and Williams 2012). One of those players are deposit holders. Deposit holders are insured up to a certain amount for their account. But uninsured liability holders face the risk of capital loss if a bank fails. Therefore, deposit holders monitor banks. They can punish banks for unacceptable risks by withdrawing their money, like shareholders can sell their share (Balasubramnian and Cyree 2014). Leledakis and Pyrgiotakis (2019) show that there are more acquisitions among small banks after the DFA than before, because a larger bank can better cover the compliance costs regarding new regulation.

A more theoretical study of Wilmarth Jr. (2011) suggests that the 'too big to fail' problem is not solved by the Dodd-Frank Act. It is based on the same supervisory instrument that was not able to prevent the financial crisis, namely capital-based regulation. It is also based on the same regulatory agencies that failed to stop unreasonable risk-taking by financial institutions. Gao et al. (2018) find that the market also doubts the effectiveness of the Dodd-Frank Act in solving 'the too big to fail' problem. This is reflected in the negative return shareholders and bondholders experienced.

Dimitrov et al. (2015) analyse the impact of the DFA on credit rating agencies instead of banks. They provide evidence that these agencies issue reduced ratings, give more incorrect warnings, and issue declines that are less informative about the creditworthiness and financial obligations of firms. Credit agencies do this to protect their reputation. The DFA makes optimistic ratings costlier due to legal and regulatory scrutiny for possible optimistically biased ratings.

This research aims to contribute to the existing literature by examining the unexplored effect of the introduction of the Dodd-Frank Act on earnings management in banks. The creation of the Dodd-Frank Act leads to higher levels of external monitoring (due to increased regulation and supervision) and possibly to less earnings management.

3. Hypothesis development

Fonseca and González (2008) focus on bank income smoothing via loan loss provisions. They find that bank regulation and supervision, i.e. the extent of accounting disclosure, restrictions on bank activities, and official and private supervision reduces incentives to smooth earnings in banks. They argue that if supervisory bodies have more power to discipline managers and reduce incentives for risk-taking, this will also reduce incentives for earnings management.

Dal Maso et al. (2018) focus on accounting enforcement and bank regulation. They find that accounting enforcement reduces opportunistic earnings management in banks and that bank regulation complements this effect. Bank regulators want that financial statements are not manipulated, as regulators determine the safety and soundness of banks based on these reports. To achieve this, they want to restrict opportunistic behavior of bank managers. Leventis et al. (2011) focus on the effect of the implementation of IFRS on banks. IFRS enhances the transparency of financial information and therefore enables monitoring by stakeholders. They find that earnings quality improved after the implementation of IFRS. It weakens incentives for bank managers to engage in earnings management using loan loss provisions.

Adapting these results to my setting, I expect that banks engage in less earnings management via loan loss provisions following the Dodd-Frank Act. The Dodd-Frank Act increased regulatory requirements and supervision of regulatory bodies, see also section 2.4.2 and 2.4.3. The regulatory disclosure requirements in the form of living wills, credit exposure reports and stress tests lead to more insights in how the banks perform. This results in more transparency and less information asymmetry. Regulators want that these additional reports (besides the financial statements) are free of manipulation. Among other things, these reports form the basis in determining the capital ratios. Regulators can sanction the banks if they do not conform to the rules or if the results of the reports are negative for the financial stability of the country.

The market also monitors and disciplines the banks on excessive risk-taking. The disclosure of information facilitates both regulators and other stakeholders to monitor the banks. The creation of the FSOC, whistleblower provision and risk committees also leads to an increase in monitoring of banks following the DFA. As explained in section 2.3, external monitoring can reduce incentives for opportunistic behavior as this increase in scrutiny can come with negative consequences.

More specific, as the level of requirements and therefore the level of external monitoring increases with the asset thresholds, I expect that that the Dodd-Frack Act will mostly have an

impact on regional and large banks' incentives to engage in earnings management. These theoretical arguments lead to the following hypothesis in alternative form:

H1*: Earnings management in banks with assets above $10 billion is lower following the enactment of the Dodd-Frank Act.*

All provisions that are identified in section 2.4.2 and 2.4.3 point towards reduced incentives to engage in earnings management due to more external monitoring. This does not hold for the increased capital requirements (DFA 165; DFA 171). Banks that are (close to) violating the capital requirements can have incentives to increase the capital ratio to prevent regulatory costs. Managers have some options to achieve a higher capital ratio. Managers can reclassify financial assets (Bischof et al. 2019), substitute the amount of risk-weighted assets (Ediz et al. 1998; Slovik 2012) or understate loan loss provisions (Moyer 1990; Kim and Kross 1998). For banks that hold excess capital, this capital is unavailable to invest in business opportunities. But it is not clear for these banks if higher capital requirements provide incentives for earnings management.

Bouwman et al. (2018) focus on managing regulatory capital around the DFA size thresholds. Near-below-threshold banks (banks within 30% below the threshold) have incentives to stay below the threshold to avoid additional regulatory costs. They find that these near-below-threshold banks increase their total loans (also total assets and risk-weighted assets) slower after the DFA, compared to banks far below the threshold (banks between 30% and 60% below the threshold).

So, for banks that are (close to) violating the capital requirements, there are two factors that influence the incentives to engage in earnings management. On the one hand, there is an increase in external monitoring due to the previously mentioned provisions of the DFA in section 2.4.2 and 2.4.3. This increase in external monitoring can lead to more scrutiny and the revelation of earnings management, with possible negative consequences for the bank (manager). Thus, bank managers have less incentives to engage in earnings management following the increase in external monitoring. On the other hand, banks that violate the capital requirements face regulatory costs. Consequently, banks that are near the minimum capital ratio want to prevent this. Hence, these banks have more incentives to manage earnings, either via loan loss provisions or via the other discussed methods. In short, the factor external monitoring (close to capital requirements) leads to less (more) earnings management. As it is not clear what the outcome will be, I state the following hypothesis in the null form:

***H2**: The enactment of the Dodd-Frank Act has no effect on earnings management for banks that are (close to) violating the capital requirements.*

Besides the external monitoring of banks by bank regulators, supervisory bodies and the market, there are more parties that monitor banks. Accounting regulators establish accounting standards to ensure that firms provide high-quality information to their stakeholders (Brown et al. 2014). Auditors have the responsibility to evaluate if the firms comply to the accounting standards and to assure that the accounting choices reflected in the financial statements also reflect the firm's business reality (DeFond and Zhang 2014).

Previous research documented that Big 4 auditors provide higher audit quality and are more accurate and conservative for numerous reasons. First, bigger accounting firms are less dependent on the fee of a single client. Auditors of those firms are thus less likely to bias their view. Second, bigger accounting firms want to protect their reputation and bad publicity regarding clients with abnormal accruals. They also want to avoid litigation costs regarding inaccurate reports. Third, bigger accounting firms have more means to train their auditors and attract competent auditors, use new technologies and perform second partner reviews (Lennox 1999; Lawrence et al. 2011; Berglund et al. 2018).

Chung et al. (2005) find that high-quality auditors are more likely to restrict opportunistic earnings management. That means that the external monitoring of Big 4 auditors is effective in restraining managerial opportunistic behavior. The Dodd-Frank Act increased the level of external monitoring and regulation. Again, Dal Maso et al. (2018) find that banking regulation complements accounting enforcement in affecting bank earnings quality. Given these results, I formulate the following hypothesis in the alternative form:

***H3**: The decline in earnings management is more pronounced for banks with a Big 4 auditor following the enactment of the Dodd-Frank Act.*

Another party that monitor banks are institutional investors. Institutional holdings are shares held by registered institutions like insurance and investment companies, pension funds, and money managers (Demiralp et al. 2011). Institutions with substantial ownership of firms have an increased access to firm-specific information. This information advantage facilitates greater monitoring (Piotroski and Roulstone 2004). Thus, institutional investors have the power, resources, and ability to monitor, discipline and influence managers of the firm (Chung et al. 2002).

Chung et al. (2002) find that external monitoring by institutional investors with substantial shareholdings constrain managers' opportunistic behavior. Institutional investors with low shareholdings are more interested in short-term profitability and hence have less incentives to monitor opportunistic behavior. On the other hand, institutional investors with large shareholdings are interested in long-term profitability. They have incentives to monitor firms more closely, because it is harder to sell their shares if they are not satisfied with the managers. They do not want that managers disguise the underlying business performance. Therefore, they urge better long-term performance of managers and reduce their incentives to manage earnings on a year-by-year basis. Managers can also face indirect pressure from institutional investors. Managers can believe that earnings management is useless because institutions are able to resolve the accounting policies and price the securities accurate.

Burns et al. (2010) also find that monitoring of institutional investors with large shareholdings reduces earnings management. Financial misreporting as indicated by a restatement due to accounting irregularities is associated with institutional investors with low shareholdings. They are less likely to make costly monitoring efforts because of their short investment horizon.

The financial market collapsed during the financial crisis, the U.S. stock market was falling with 42% (Acharya and Richardson 2012). So, investors lost their confidence in the financial market. The Dodd-Frank Act restructures the financial system towards a safe and sound one and tries to restore the confidence of investors in the financial market (Gao et al. 2018). Given these explanations, I state the last alternative hypothesis as follows:

H4*: The decline in earnings management is more pronounced for banks that have more institutional investors with large shareholdings following the enactment of the Dodd-Frank Act.*

4. Research design

Section 4.1 explains the methodology used in this research. Section 4.2 describes the sample selection. Section 4.3 clarifies the data preparation.

4.1 Methodology

Appendix A shows the predictive validity framework. These Libby Boxes visualize the operational framework underlying this research. This research examines the effect of the concept increased regulation on the concept managerial opportunistic behavior. The independent variable *DFA* equals one for the years following the Dodd-Frank Act (from 2011 onwards), and zero otherwise. This variable captures the exogenous shock in the concept increased regulation, which includes external monitoring. Even though the Dodd-Frank Act is enacted in July 21, 2010, I assume that bank behavior is only fully affected from 2011 onwards. The concept managerial opportunistic behavior is measured as the absolute value of abnormal loan loss provisions (|*ALLP*|).

Section 4.1.1 and 4.1.2 give a more detailed explanation of how respectively the dependent and independent variables are operationalized. Section 4.1.3 gives an overview of all the control variables that are included in the model. Section 4.1.4 provides the robustness tests.

4.1.1 Dependent variable

According to McNichols (2000), there are three models to characterize discretionary behavior. The first one is based on aggregate accruals. The second one is based on the distribution of earnings after earnings management. The third one is based on specific accruals. I use the last model as with this approach you can focus on a specific industry (banking) to characterize the likely nondiscretionary and discretionary behavior of accruals.

In order to examine the relation between the enactment of the Dodd-Frank Act and earnings management through loan loss provisions, I use a two-stage approach. This approach is consistent with Kanagaretnam et al. (2010) and Dal Maso et al. (2018).

In the first stage I estimate the normal part of loan loss provisions by regressing loan loss provisions on its determinants. This is shown in equation (1). In all models, year fixed effects are included to account for factors that are not directly observable but are constant over time for the observations. Year fixed effects control for economic shocks and general trends that might affect the dependent variable (Bindal et al. 2020). See Appendix B for the definition of the variables.

$$LLP_{it} = \beta_0 + \beta_1 BEGLLA_{i,t-1} + \beta_2 LCO_{it} + \beta_3 \Delta LOANS_i + \beta_4 \Delta NPL_i + \beta_5 LOANS_{it} + \beta_6 NPL_{it} + \sum \beta_f \ (Year) + \varepsilon_{it} \quad (1)$$

where, for bank *i* and fiscal year *t*, *LLP* is loan loss provisions in *t* for bank *i*. *BEGLLA* is loan loss allowance in *t* – 1 for bank *i*; *LCO* is net charge-offs in *t* for bank *i*; *LOANS* is total value of loans in *t* for bank *i*; *NPL* is nonperforming loans in *t* for bank *i*; *ΔLOANS* and *ΔNPL* are the change from *t* − 1 to *t* in total *LOANS* and *NPL* for bank *i*. All continuous variables in this regression are divided by prior total assets to reduce heteroskedasticity (Jones 1991).

BEGLLA is included because if the bank recognizes a sufficiently high provision in the past, the current provision is lower (Beatty and Liao 2014). *LCO* is included because these net charge-offs are actual losses on a bank's loan portfolio and reduce the loan loss reserve (Balasubramanyan and Madias 2015). *LOANS* is included because loan loss provisions reflect expected future losses on banks' loan portfolios (Anandarajan et al. 2003). *NPL* are loans where the lender is behind the contractual schedule of payments. Information about *NPL* is used to estimate loan loss provisions (Beatty and Liao 2014). *ΔLOANS* is included because loan loss provisions may be higher when the bank lends money to more clients with lower credit (Beatty and Liao 2014). *ΔNPL* is included because this reflects the current credit risk (Ahmed et al. 1999). Following Kanagaretnam et al. (2010) and Dal Maso et al. (2018), I expect a positive association between *LLP* and *LCO*, *NPL*, *LOANS* and *ΔNPL*. On the other hand, I expect a negative association between *LLP* and *BEGLLA* and *ΔLOANS*.

I define the error term of equation (1) as *ALLP*, which are the abnormal part of loan loss provisions. In the second stage I estimate the absolute value of *ALLP* as a measure of earnings management, this is the dependent variable in this research. This is shown in equation (2).

$$|ALLP|_{it} = \varepsilon_{it} = LLP_{it} - [\hat{\beta}_0 + \hat{\beta}_1 BEGLLA_{i,t-1} + \hat{\beta}_2 LCO_{it} + \hat{\beta}_3 \Delta LOANS_i + \hat{\beta}_4 \Delta NPL_i + \hat{\beta}_5 LOANS_{it} + \hat{\beta}_6 NPL_{it} + \sum \beta_f \ (Year)] \quad (2)$$

A higher value of $|ALLP|$ means that the absolute value of the abnormal part of loan loss provisions is higher and thus indicates more opportunistic earnings management (Fan et al. 2019).

4.1.2 Independent variables

To test if earnings management in banks with assets above $10 billion is lower following the enactment of the Dodd-Frank Act (Hypothesis 1), I use the following model:

$$|ALLP|_{it} = \beta_0 + \beta_1 DFA_{it} + \beta_2 Bank\ size_{it} + \beta_3 DFA_{it} * Bank\ size_{it} + \sum \beta_k\ Control\ variables_{it} + \sum \beta_f\ (Year) + \varepsilon_{it} \quad (3)$$

where, for bank *i* and fiscal year *t*, $|ALLP|$ is the dependent variable as shown in equation (2). *DFA* is equal to one for the years following the Dodd-Frank Act (from 2011 onwards), and zero otherwise. *Bank size* is equal to one if the bank is a regional bank (consolidated assets between $10 and $50 billion) or a large bank (consolidated assets above $50 billion), and zero otherwise. The coefficient β_1 measures the Dodd-Frank effect on earnings management for small banks. The coefficient β_2 measures the relation between regional and large banks and earnings management before the Dodd-Frank Act. The variable of interest is β_3. This variable captures the interaction term *DFA * Bank size*. This term measures the extra effect of the Dodd-Frank Act on earnings management for regional and large banks, compared to before the Dodd-Frank Act and small banks. Consistent with Hypothesis 1, I expect β_3 to be negative as the level of requirements and the level of external monitoring increases with asset thresholds.

However, banks that are (close to) violating the capital requirements can have incentives to manage earnings to prevent regulatory costs. On the other hand, they also face increased external monitoring. To test if the Dodd-Frank Act influences earnings management for these banks (Hypothesis 2), I use the following model:

$$|ALLP|_{it} = \beta_0 + \beta_1 DFA_{it} + \beta_2 Close\ to\ CAP_{it} + \beta_3 DFA_{it} * Close\ to\ CAP_{it} + \sum \beta_k\ Control\ variables_{it} + \sum \beta_f\ (Year) + \varepsilon_{it} \quad (4)$$

where, for bank *i* and fiscal year *t*, $|ALLP|$ is the dependent variable as shown in equation (2). *DFA* is equal to one for the years following the Dodd-Frank Act (from 2011 onwards), and zero otherwise. *Close to CAP* is a variable that represents banks that are (close to) violating the capital requirements. This variable is equal to one for banks that are less than well-capitalized[3],

[3] A bank is well-capitalized if its Tier 1 capital ratio, total capital ratio and Tier 1 leverage ratio is at least 6%, 10% and 5% respectively. The regulatory minimums are respectively 4%, 8% and 4%. From 2015 onwards, the well-capitalized Tier 1 capital ratio is 8% and its minimum is 6% (Barth and Miller 2017). For reasons outlined in section 4.2, the Tier 1 leverage ratio is not used to be characterised as well-capitalized.

and zero otherwise. The coefficient β_1 measures the Dodd-Frank effect on earnings management for well-capitalized banks. I expect that β_1 is negative. The Dodd-Frank Act increases regulation. The provisions of the Dodd-Frank Act lead to more disclosure of information, this enables regulators and other stakeholders to monitor and discipline banks. This can reduce incentives to engage in earnings management. The coefficient β_2 captures the relation between less than well-capitalized banks and earnings management before the Dodd-Frank Act. The variable of interest is β_3. This variable captures the interaction term *DFA * Close to CAP*. This term measures the extra effect of the Dodd-Frank Act on earnings management for less than well-capitalized banks, compared to before the Dodd-Frank Act and well-capitalized banks. In line with Hypothesis 2, I do not make a prediction of the sign of β_3. It is unclear what the effect of the Dodd-Frank Act on earnings management is for banks that are near the minimum capital requirements, because the factor external monitoring (close to capital requirements) leads to less (more) earnings management.

To test if the decline in earnings management is more pronounced following the enactment of the Dodd-Frank Act for banks with a Big 4 auditor or banks that have more institutional investors with large shareholdings (respectively Hypothesis 3 and Hypothesis 4), I use the following model:

$$|ALLP|_{it} = \beta_0 + \beta_1 DFA_{it} + \beta_2 Bank\ size_{it} + \beta_3 DFA_{it} * Bank\ size_{it} + \beta_4 Monitor_{it} + \beta_5 DFA_{it} * Monitor_{it} + \sum \beta_k\ Control\ variables_{it} + \sum \beta_f\ (Year) + \varepsilon_{it} \quad (5)$$

where, for bank *i* and fiscal year *t*, $|ALLP|$ is the dependent variable as shown in equation (2). *DFA* is equal to one for the years following the Dodd-Frank Act (from 2011 onwards), and zero otherwise. *Bank size* is equal to one if the bank is a regional bank (consolidated assets between $10 and $50 billion) or a large bank (consolidated assets above $50 billion), and zero otherwise. *Monitor* is a variable that represents an external monitoring party of the bank. For Hypothesis 3, *Monitor* is a dummy variable *BIG4*. *BIG4* equals one if the bank is audited by Deloitte, PwC, EY, or KPMG, and zero otherwise. For Hypothesis 4, *Monitor* is a dummy variable *INST*. Institutional ownership is measured according to the methodology of Chung et al. (2002). Annually, I calculate the median percentage institutional share ownership for the banks in the sample. Institutional ownership is the ratio of number of shares held by institutional investors scaled by the total number of common shares outstanding in the bank. The variable *INST* equals one if the percentage institutional ownership is equal to or higher than the yearly median and is

equal to zero if the percentage of institutional ownership is lower than the yearly median. If *INST* is coded one, I assume that the institutional investors have large shareholdings and therefore have incentives to monitor the bank managers more closely. On the other hand, if *INST* is coded zero, these incentives are weaker because the institutional investors have low shareholdings.

The coefficient β_4 measures the relation between a monitoring party of the bank (a Big 4 auditor for Hypothesis 3 and institutional investors with large shareholdings for Hypothesis 4) and earnings management before the Dodd-Frank Act. The variable of interest is β_5. This variable captures the interaction term *DFA * BIG4* (Hypothesis 3) or *DFA * INST* (Hypothesis 4). This term measures the extra effect of the Dodd-Frank Act on earnings management for banks with a Big 4 auditor (or institutional investors with large shareholdings), compared to before the Dodd-Frank Act and banks with a non-Big 4 auditor (or institutional investors with low shareholdings). The Dodd-Frank Act represents a higher level of external monitoring. In line with Hypothesis 3 and 4, I expect β_5 to be negative. High-quality auditors and institutional investors with large shareholdings are more likely to restrict earnings management.

4.1.3 Control variables

One concern with research on the effects of regulation change is that any differences in discretionary loan loss provisions following the Dodd-Frank Act are attributed to the regulatory change. These changes may also occur without intervention. Therefore, control variables are included to control for possible confounding events and to reduce omitted variable bias (Beatty and Liao 2014). This section summarizes the control variables that are included in equation (3), (4) and (5) and why they should be included.

Size is included as control variable because the requirements of the DFA increase with bank size. This variable is only included in equation (4), to prevent multicollinearity problems with the variable *Bank size.* Larger banks are subject to more regulatory scrutiny and monitoring (Beatty and Liao 2014). Larger banks have in general more business activity and thus have higher loan loss provisions than smaller banks (Anandarajan et al. 2003). But Leventis et al. (2011) note that large banks will also have more credit portfolio diversification. *Size* is measured as the natural logarithm of total assets. The expected sign of *Size* is negative, because larger banks are monitored more by regulators and other stakeholders (Cornett et al. 2009).

Leverage is included as a control variable and is measured as the ratio of total liabilities to total assets. Banks with a higher debt-to-equity ratio are closer to breaching debt covenants (Watts and Zimmerman 1990). Large banks have to adhere to a maximum debt-to-equity ratio

of 15 to 1 or a minimum leverage ratio of 6.5% (DFA 165). So, firms with more debt are more likely to engage in income-increasing earnings management (Watts and Zimmerman 1990). Therefore, I expect a positive coefficient for *Leverage*.

Prior literature suggests that Big 4 auditors provide higher audit quality and are more likely to restrict opportunistic earnings management (Chung et al. 2005). Accordingly, a dummy variable *BIG4* is included that equals one for banks that are audited by Deloitte, PwC, EY, or KPMG, and zero otherwise. I expect the sign of *BIG4* to be negative.

Institutional ownership (*INST*) is included as control variable because firms with greater institutional ownership are more monitored and are therefore less likely to report opportunistic (Chung et al. 2002; Burns et al. 2010). Hence, I expect the sign of *INST* to be negative. *INST* equals one if the percentage of institutional ownership is equal to or higher than the yearly sample median and is zero otherwise.

Previous research document that the loan loss provisioning of banks is procyclical. Banks' loan loss provisions are higher when GDP (Gross Domestic Product) growth is lower. During economic downturns, the level of defaults on the loans is higher (Bikker and Metzemakers 2005). Huizinga and Laeven (2012) show that banks that had large losses from mortgage-backed securities during the financial crisis in 2008 understate loan loss provisions. So, I control for the GDP growth and expect that the sign of ΔGDP is negative. ΔGDP is measured as the percentage change in GDP from this year compared to previous year.

Tier 1 is included as control variable because this ratio is associated with earnings management through loan loss provisions. Changes in loan loss provisions can occur because bank managers manage earnings through loan loss provisions to meet the capital requirements of the DFA (Healy and Wahlen 1999). *Tier 1* is the Tier 1 capital scaled by risk-weighted assets. I do not make a prediction of the sign of *Tier* 1. It is known that banks with lower capital ratios are more likely to manage earnings to prevent violating the minimum capital ratio (Moyer 1990). But it is unknown if banks with higher capital ratios are likely to engage in earnings management.

The market-to-book ratio (*MTB*) is included as control variable because this reflects the growth prospects of a firm. Compensation of managers often include stock (options). In this way, managers and shareholders share the risks of growth (Cornett et al. 2009). *MTB* is measured as the market value of equity scaled by the book value of equity, both at the end of the fiscal year. Managers can have incentives to manage earnings to influence stock price performance but is not clear how these incentives deviate for different levels of *MTB*.

4.1.4 Robustness tests

To examine if the results are robust, I include one robustness measure that applies to all models. I use an alternative measure for the dependent variable that is shown in equation (2). Instead of using the absolute value of the residuals from equation (1) as a measure for earnings management, I use the absolute value of the negative error term from equation (1) as the dependent variable. This variable capture income-increasing earnings management. According to Dal Maso et al. (2018), income-increasing earnings management leads to overstated earnings and performance and to understated loan loss provisions and riskiness of banks' loan portfolios. This is interesting, because the Dodd-Frank Act aims to decrease the risk of banks.

I also identify if comparable results are obtained when the financial crisis years (2007-2009) are excluded from the sample (Bouwman et al. 2018). This is to assure that I observe a Dodd-Frank effect (Bindal et al. 2020) instead of results that are due to the financial crisis (Dimitrov et al. 2015). For brevity, the result of this robustness test is only presented for Hypothesis 1.

Some robustness measures only apply to a specific model. For Hypothesis 2, I use an alternative measure for the independent variable *Close to CAP* in equation (4). The alternative measure is called *MCAP* and is based on Leventis et al. (2011). This variable is calculated as the Tier 1 capital ratio divided by its minimum (*MCAP1*) or the total capital ratio divided by its minimum (*MCAP3)*. The lower the ratio of *MCAP* is, the less capitalized the bank is and the closer to violating the capital requirements. I center the variable *MCAP* at the cut-off point to be characterized as well-capitalized[4] for better interpretable coefficients.

Furthermore, I conduct a robustness test for Hypothesis 3. There is a potential self-selection issue in equation (5) for the variable *BIG4*. This model does not control for the potential self-selection into hiring a Big 4 or non-Big 4 auditor. It is possible that banks with less earnings management are more likely to choose high-reputation auditors, and that high-reputation auditors may prefer banks with less earnings management (Kanagaretnam et al. 2010). To deal with this problem, I use the Heckman (1979) two-stage procedure as proposed in Kanagaretnam et al. (2010). First, I estimate a probit model of auditor choice as shown in equation (6). I obtain the Inverse Mills Ratio (*IMR*) from this model. Afterwards, I include the *IMR* as an additional independent variable in equation (5).

[4] Using the variable *MCAP1,* the cut-off point to be characterized as well-capitalized is 1.5 before 2015 (6%/4%) and 1.33 after 2015 (8%/6%). Using the variable *MCAP3*, the cut-off point to be characterized as well-capitalized is 1.25 (10%/8%). See footnote 3 for a refresher on the different regulatory capital requirements.

$$BIG4_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 ROA_{it} * LOSS_{it} + \beta_3 LnLOANS_{it} + \beta_4 \Delta LOANS_i + \beta_5 Tier\ 1_{it} + \beta_6 LOANRATIO_{it} + \beta_7 NPLRATIO_{it} + \varepsilon_{it} \quad (6)$$

where, for bank *i* and fiscal year *t*, *BIG4* equals one if bank *i* is audited by Deloitte, PwC, EY, or KPMG in *t*, and zero otherwise. *ROA* is the net income scaled by previous total assets for bank *i* in *t*; *LOSS* equals one if bank *i* has a loss in *t*, and zero otherwise; *LnLOANS* is the natural logarithm of the total value of loans in *t* for bank *i*; *ΔLOANS* is the change from *t* – 1 to *t* in total value of loans for bank *i*; *Tier 1* is the ratio of Tier 1 capital to risk-weighted assets in *t* for bank *i*; *LOANRATIO* is the value of total loans outstanding for bank *i* in *t*, scaled by total assets; *NPLRATIO* is the value of nonperforming loans in *t* for bank *i*, scaled by total value of loans.

I also use an alternative measure for the independent variable institutional ownership (*INST*) that is used in equation (5) to test Hypothesis 4. The measure that is presented in section 4.1.2 has one downfall. It is possible that for banks where the percentage of institutional ownership is equal to or above the yearly sample median, that each investor only has a small portion of the bank's shares instead of large shareholdings. This problem is partly mitigated because the database Thomson Reuters contains only larger institutional investors. Only institutional investors with more than $100 million dollar of securities under their responsibility must report their holdings on Form 13F. Moreover, they only have to disclose their holdings in firms if they have more than 10,000 shares or shares worth more than $200,000 (Luo et al. 2014). The alternative measure of institutional ownership is similar to Demiralp et al. (2011). The variable *C5* is the largest five institutional ownership size. *C5* is the number of shares held by the five institutional investors with the largest shareholdings, divided by the total number of common shares outstanding in the bank. A higher *C5* means that a small number of institutions owns a large proportion of the shares. This indicates that the bank is monitored closely. I mean-center *C5* for better interpretable coefficients.

Besides the alternative measure for institutional ownership, I also modify the original measure of institutional ownership (*INST2*). Instead of using the yearly sample median of the percentage institutional ownership as threshold for higher monitoring incentives, I use the yearly 75th (25th) percentile as constraint for high (low) monitoring incentives by institutional investors. This is based on Erkens et al. (2018), who use this as robustness test for strong versus weak clawbacks.

4.2 Sample selection

This research includes all listed commercial banks from the United States for the period 2000-2017. I only include listed banks in the sample. That is because Burgstahler et al. (2006) state that public firms have different incentives than private firms to engage in earnings management. As mentioned earlier, I also only include commercial banks in the sample. Commercial banks use customer deposits to provide loans to clients, while investment banks provide services for investment products (Moutsianas and Kosmidou 2016). This research focuses on earnings management through loan loss provisions; hence investment banks are not suitable to study. The sample end-year is 2017, because some provisions of the Dodd-Frank Act changed in 2018. For instance, the asset threshold for classification as SIFI increased from $50 billion to $250 billion (Werner 2018). Another loosened requirement is the provision for risk committees. Only banks with assets above $50 billion are required to have a risk committee, instead of banks with assets above $10 billion (U.S. Congress 2018).

I retrieve the data from the Wharton Research Data Services (WRDS) system for U.S. commercial banks (sic code 6020) and savings institutions (sic code 6035 and 6036). I collect yearly accounting data from the Compustat Bank Fundamentals Annual database. I also include the annual Gross Domestic Product (GDP) from the U.S. Bureau of Economic Analysis (2020) in the sample. I obtain the bank's audit firm from the Audit Analytics Audit fees database. I merge this dataset one-to-one with the accounting data using the common identifiers CIK and fiscal year. Further, I obtain the fiscal year-end closing price from the Compustat North America Fundamentals Annual database. I merge this dataset one-to-one with the accounting data using the common identifiers GVKEY and fiscal year.

I gather institutional ownership data from the Thomson Reuters Institutional Holdings (13F) Stock Ownership database. As this data is quarterly and the accounting data is annual, I merge both datasets using CUSIP, fiscal year and month as common identifier. This is to ensure that only the institutional ownership data that corresponds to the same month as the fiscal year-end for a specific fiscal year is merged. Following Piotroski and Roulstone (2004), the level of institutional ownership is set to zero if there is no institutional ownership data for bank *i* in fiscal year *t*. Two banks have institutional ownership data, but their fiscal year end is April or July in some years, institutional ownership is hence also set to zero. Institutional ownership is set to 100% of the common shares outstanding if there are institutions that have more than 100% of the shares (Lewellen 2011).

For the computation of the Tier 1 leverage ratio, data on Tier 1 capital is necessary. This is available in the Bank Regulatory database. The RSSD ID is the identifier in this database. I

use the linking table from the Federal Reserve Bank of New York (2018) to link the RSSD IDs with the identifier PERMCO. I further link the PERMCO identifier with the GVKEY identifier using the CCM linking table from the CRSP/Compustat Merged Database. I identify 1,378 unique matches between the RSSD ID and GVKEY. Of these matches, I obtain the quarterly Tier 1 capital. Only 72 banks from the matches have this data available in the Bank Regulatory database. If I merge this data with the annual accounting data (using GVKEY, fiscal year and month as common identifier), only 11 banks remain with Tier 1 capital data. Therefore, I decide not to use the Tier 1 leverage ratio for this research.

There are some modifications necessary to come to the final sample for this research. First, observations from non-listed banks are removed from the sample. Second, I limit the sample to bank-years with non-missing data for the calculation of the dependent variable. Third, bank-years with missing data for the independent and control variables are also excluded. This leads to the final sample of 9,378 unique bank-years and 1,120 unique banks for the years 2000-2017. The full sample selection process is shown in Table 1 Panel A. Table 1 Panel B gives an overview of the number of banks in the sample per size category and year. In total, there are 1,120 unique banks of whom 1,059 are small banks, 109 regional banks and 35 large banks. See Appendix B for a complete overview of the definitions of all the variables used in this research.

4.3 Data preparation

Appendix C shows the correlation matrix. Similar to my predictions, there is a significant negative correlation between *DFA*, *Bank size*, *BIG4*, *INST* and |*ALLP*|. There are some high correlations in the correlation matrix. For example, the correlation between *Bank size* and *Size* is highly positively significant. These variables are both based on total assets, but this is not a problem since they are not included in the same regression. The variables *LOANS* and Δ*LOANS* have a high positive significant correlation. These variables are both based on the total value of loans. Lastly, the correlation between *LLP* and *LCO* is highly negatively significant. When the loan charge-offs increases, the loan loss provision decreases, and vice versa. A possible explanation is that net charge-offs are actual losses on a bank's loan portfolio and reduce the loan loss reserve (Balasubramanyan and Madias 2015). Because of these high correlations, I test the independent variables of equation (1) for multicollinearity with the Variance Inflation Factor (VIF) test. A VIF-value above five is a concern for multicollinearity (O'Brien 2007). A VIF-value above ten is a weak collinearity problem (Belsley et al. 1980).

Table 1 Sample selection process and distribution by bank category-year

Panel A: Sample selection process									
				Unique banks			Unique bank-years		
Compustat Bank Fundamentals				**1,406**			**12,683**		
Less: Merge with Audit Analytics				-238			-2,309		
Less: Merge with Compustat				0			0		
Less: Merge with Thomson Reuters				0			0		
Database after merging				**1,168**			**10,374**		
Less: Non-listed banks				-26			-10		
Less: Missing values for dependent variable				-10			-568		
Less: Missing values for *Close to capital requirements*				-12			-418		
Final sample 2000-2017				**1,120**			**9,378**		
Panel B: Number of banks by category and year									
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Small banks	457	552	576	525	470	518	538	513	478
Regional banks	33	36	37	40	34	36	41	38	37
Large banks	16	16	18	16	16	18	19	22	21
Total	506	604	631	581	520	572	598	573	536
	2009	2010	2011	2012	2013	2014	2015	2016	2017
Small banks	465	451	460	437	417	403	387	357	336
Regional banks	37	36	36	40	42	46	44	50	55
Large banks	20	19	17	16	16	17	18	17	18
Total	522	506	513	493	475	466	449	424	409

Panel A summarizes the sample selection process. The sample includes 9,378 bank-year observations with non-missing values from 2000 to 2017 after excluding non-listed banks. Only U.S. commercial banks (sic code 6020) and savings institutions (sic code 6035 and 6036) are included. Panel B presents the number of banks that are included in the final sample by category-year.

Appendix D Panel A shows that all VIF-values are below five, so I assume that multicollinearity is not a problem in this model.

I also inspect if the variation of the residuals of the models is not constant with the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity. The null hypothesis is that the variance of the residuals is homoscedastic. As shown in Appendix D Panel B, the p-values are less than 0.01, which means the residuals of the models are heteroskedastic (Breusch and Pagan 1979). I solve this issue by using cluster-robust standard errors at the bank-level for all models.

All continuous variables except for ΔGDP are winsorized at 1% and 99% to control for the effect of outliers (Fan et al. 2019). ΔGDP is not winsorized, this would give a distorted image about the state of the economy. The inferences remain the same if ΔGDP is winsorized.

5. Empirical results and analysis

Section 5.1 reports the descriptive statistics of the sample. Section 5.2 through 5.5 present the empirical results of the analyses. Section 5.6 documents the robustness tests.

5.1 Descriptive statistics

Table 2 presents the descriptive statistics of the variables used in equation (1)-(5). The mean *LLP* and |*ALLP*| is respectively 0.41% and 0.12%. The mean value of total loans is 73% and banks have on average 90% debt in their capital structure. Banks have on average 15 billion assets and 11% of the banks is a regional or large bank. The banks have an average market-to-book ratio of 1.40. The average Tier 1 capital ratio is 12.04% and 97% of the banks are well-capitalized. In 53% of the cases the percentage of institutional ownership in banks is equal to or higher than the yearly sample median and 36% of the banks is audited by a Big 4 auditor.

Table 2 Descriptive statistics for the ALLP tests

Variable	Mean	Std. Dev.	Min.	Q1	Median	Q3	Max.
|ALLP|	0.0012	0.0015	0	0.0003	0.0007	0.0015	0.0087
Bank size	0.1107	0.3138	0				1
BEGLLA	0.0095	0.0047	0.0016	0.0066	0.0086	0.0110	0.0303
BIG4	0.3614	0.4804	0				1
Close to CAP	0.0289	0.1675	0				1
DFA	0.3443	0.4752	0				1
ΔGDP	0.0386	0.0184	– 0.0183	0.0324	0.0404	0.0455	0.0631
ΔLOANS	0.0710	0.1196	– 0.1474	0.0057	0.0483	0.1058	0.6237
ΔNPL	0.0014	0.0097	– 0.0283	– 0.0019	0.0001	0.0030	0.0484
INST	0.5257	0.4994	0				1
LCO	– 0.0032	0.0053	– 0.0301	– 0.0034	– 0.0013	– 0.0004	0.0009
Leverage	0.9002	0.0316	0.7757	0.8864	0.9049	0.9199	0.9665
LLP	0.0041	0.0063	– 0.0022	0.0009	0.0020	0.0043	0.0364
LOANS	0.7331	0.1781	0.2886	0.6211	0.7212	0.8307	1.3400
MTB	1.3950	0.6762	0.1910	0.9316	1.2858	1.7477	3.7016
NPL	0.0138	0.0169	0	0.0036	0.0079	0.0168	0.0931
Size	7.3327	1.4908	4.7939	6.3133	7.0236	8.0626	12.4182
Tier 1	12.0354	3.4361	5.5300	9.8000	11.5800	13.7000	24.7400
Number of observations: 9,378							

This table presents the descriptive statistics for the ALLP tests. The sample includes 9,378 bank-year observations with non-missing values from 2000 to 2017 after excluding non-listed banks. Only U.S. commercial banks (sic code 6020) and savings institutions (sic code 6035 and 6036) are included. Each year, all continuous variables except for Δ*GDP* are winsorized at 1% and 99% and all variables are described in Appendix B.

5.2 Earnings management through loan loss provisions

Before testing the hypotheses, I regress the loan loss provisions (*LLP*) on its determinants. The absolute value of the error term from this regression is the abnormal part of loan loss provisions (|*ALLP*|). This variable represents the dependent variable in this research. Table 3 reports the results from this first-stage regression. In line with previous research (Kanagaretnam et al. 2010; Dal Maso et al. 2018), I find a significant positive association between *LLP* and Δ*NPL*, *LOANS* and *NPL* and a significant negative association between *LLP* and *BEGLLA*. On the contrary, I find a significant negative (positive) relation between *LLP* and *LCO* (*ΔLOANS*). For *ΔLOANS*, it is probable that the loan loss provisions are higher when the bank lends money to more clients with lower credit (Beatty and Liao 2014). The reasoning behind the sign of *LCO* is less clear.

Table 3 First-stage regression loan loss provisions

	LLP
BEGLLA	– 0.1428***
	(– 10.44)
LCO	– 1.0492***
	(– 68.37)
ΔLOANS	0.0008*
	(1.70)
ΔNPL	0.1061***
	(14.38)
LOANS	0.0028***
	(11.48)
NPL	0.0126***
	(2.75)
Constant	– 0.0002
	(– 1.13)
Year fixed effects	yes
Observations	9,378
Adjusted R^2	0.87

*, **, *** symbolize significance at the 10%, 5%, and 1% level (two-tailed), respectively

This table reports the results of equation (1). This model regresses loan loss provisions on its determinants. The sample includes 9,378 bank-year observations with non-missing values from 2000 to 2017 after excluding non-listed banks. Only U.S. commercial banks (sic code 6020) and savings institutions (sic code 6035 and 6036) are included. Each year, all continuous variables except for Δ*GDP* are winsorized at 1% and 99% and all variables are described in Appendix B. The t-statistics in parentheses are based on cluster-robust standard errors at the bank-level.

5.3 The Dodd-Frank effect on earnings management

I begin with the test if earnings management in banks is lower following the enactment of the Dodd-Frank Act, especially for banks with assets above $10 billion (Hypothesis 1). Table

4 reports the results from equation (3) to test this hypothesis. *Bank size* is the independent variable in this model and is equal to one if the bank is a regional bank (consolidated assets between $10 and $50 billion) or a large bank (consolidated assets above $50 billion), and zero otherwise. The coefficient of *Bank size* is not significant, which means that before the Dodd-Frank Act, there is on average no difference in the level of earnings management for regional and large banks, compared to small banks. The coefficient of *DFA* is significant and negative ($p<0.01$). The enactment of the Dodd-Frank Act is associated with on average less earnings management in all banks. The coefficient of the interaction term *DFA * Bank size*, which is the variable of interest, is significant and negative ($p<0.05$). This suggests that there is, on average, less earnings management in regional and large banks after the Dodd-Frank Act, compared to before and small banks. In terms of economic significance, the Dodd-Frank Act implies an average decrease in $|ALLP|$ of 0.08% for regional and large banks, all else being equal. So, Table 4 provides sufficient evidence to support Hypothesis 1 (and to reject the null hypothesis). Earnings management in banks with assets above $10 billion is lower following the enactment of the Dodd-Frank Act. I argue that the reason is the increased level of regulation and external monitoring, which is higher for larger banks. The sign of some significant control variables is consistent with previous research. Banks with greater institutional ownership (*INST*) have less earnings management. The expected sign of *MTB* and *Tier 1* was unclear beforehand. The coefficients of both these control variables are significantly negative, meaning that a higher market-to-book ratio and Tier 1 capital ratio is associated with less earnings management. This can imply that bank managers of more overvalued banks want to prevent the negative consequences of the revelation of earnings management and that banks with higher capital ratios have less incentives to engage in earnings management.

5.4 The Dodd-Frank effect on earnings management and influence of capital ratio

Next, I test if the Dodd-Frank Act influences earnings management for banks that are (close to) violating the capital requirements (Hypothesis 2). I test this hypothesis using equation (4), where the independent variable is *Close to CAP*. *Close to CAP* equals one for banks that are less than well-capitalized, and zero otherwise. Table 5 reports the result of equation (4). The coefficient of *Close to CAP* is significant and positive ($p<0.01$). This means that before the Dodd-Frank Act, there is on average more earnings management in banks that are close to violating the capital requirements than in well-capitalized banks. The coefficient of *DFA* is as expected significantly negative ($p<0.01$). There is a negative association between the Dodd-Frank Act and the absolute value of abnormal loan loss provisions in all banks. The coefficient

Table 4 The Dodd-Frank effect on earnings management

	|ALLP|	|ALLP| Residual < 0
DFA	– 0.055***	– 0.037***
	(– 4.80)	(– 3.18)
Bank size	0.004	– 0.014*
	(0.42)	(– 1.87)
DFA * Bank size	**– 0.020****	**0.003**
	(– 2.14)	**(0.27)**
BIG4	– 0.004	– 0.006
	(– 0.83)	(– 1.25)
INST	– 0.010**	– 0.008*
	(– 2.27)	(– 1.90)
ΔGDP	– 0.319	– 0.367
	(– 1.06)	(– 1.04)
Leverage	0.075	– 0.046
	(0.87)	(– 0.63)
MTB	– 0.033***	– 0.027***
	(– 8.48)	(– 6.45)
Tier 1	– 0.002***	– 0.003***
	(– 2.94)	(– 4.09)
Constant	0.152*	0.240***
	(1.78)	(3.30)
Year fixed effects	yes	yes
Observations	9,378	5,090
Adjusted R^2	0.12	0.13

*, **, *** symbolize significance at the 10%, 5%, and 1% level (two-tailed), respectively

This table reports the results of equation (3). This model tests if earnings management is lower after the Dodd-Frank Act, especially for larger banks (Hypothesis 1). The second column only tests income-increasing earnings management (see section 5.6). The dependent variable is multiplied by 100 for presentation purposes. The sample includes 9,378 bank-year observations with non-missing values from 2000 to 2017 after excluding non-listed banks. Only U.S. commercial banks (sic code 6020) and savings institutions (sic code 6035 and 6036) are included. Each year, all continuous variables except for Δ*GDP* are winsorized at 1% and 99% and all variables are described in Appendix B. The t-statistics in parentheses are based on cluster-robust standard errors at the bank-level.

of the variable of interest, the interaction term *DFA * Close to CAP*, is not significant. This suggests that the Dodd-Frank effect on earnings management is on average not different for less than well-capitalized and well-capitalized banks. For all banks, the DFA seems to result in less earnings management on average. In sum, Table 5 provides sufficient evidence to reject Hypothesis 2. This finding implies that the enactment of the Dodd-Frank Act also influences earnings management for banks that are (close to) violating the capital requirements. Even though capital requirements can lead to more earnings management, the increase in external monitoring resulting from the implementation of the Dodd-Frank Act is associated with a reduction in earnings management, also for banks close to the minimum capital ratio. The same

Table 5 The Dodd-Frank effect on earnings management and influence of capital ratio

	|ALLP|	|ALLP| Residual < 0
DFA	– 0.056***	– 0.034***
	(– 4.91)	(– 2.90)
Close to CAP	0.106***	0.061***
	(6.31)	(4.06)
DFA * Close to CAP	**– 0.026**	**0.004**
	(– 0.79)	**(0.12)**
BIG4	– 0.003	– 0.004
	(– 0.50)	(– 0.77)
INST	– 0.008*	– 0.005
	(– 1.83)	(– 1.16)
ΔGDP	– 0.362	– 0.384
	(– 1.21)	(– 1.10)
Leverage	– 0.004	– 0.088
	(– 0.05)	(– 1.25)
MTB	– 0.029***	– 0.024***
	(– 7.32)	(– 5.58)
Size	– 0.001	– 0.003*
	(– 0.71)	(– 1.95)
Tier 1	– 0.001***	– 0.002***
	(– 1.82)	(– 3.29)
Constant	0.214**	0.285***
	(2.51)	(3.95)
Year fixed effects	yes	yes
Observations	9,378	5,090
Adjusted R^2	0.13	0.14

*, **, *** symbolize significance at the 10%, 5%, and 1% level (two-tailed), respectively
This table reports the results of equation (4). This model examines if the Dodd-Frank Act has an effect on earnings management for banks that are (close) to violating the capital requirements (Hypothesis 2). The second column only tests income-increasing earnings management (see section 5.6). The dependent variable is multiplied by 100 for presentation purposes. The sample includes 9,378 bank-year observations with non-missing values from 2000 to 2017 after excluding non-listed banks. Only U.S. commercial banks (sic code 6020) and savings institutions (sic code 6035 and 6036) are included. Each year, all continuous variables except for Δ*GDP* are winsorized at 1% and 99% and all variables are described in Appendix B. The t-statistics in parentheses are based on cluster-robust standard errors at the bank-level.

control variables as in equation (3) are significant and negative. Banks with greater institutional ownership, a higher market-to-book ratio and a higher Tier 1 capital ratio exhibit less earnings management.

5.5 The Dodd-Frank effect on earnings management and influence of external monitoring

The last analysis comprises the test if the decline in earnings management following the Dodd-Frank Act is more pronounced for banks with a Big 4 auditor or banks that have more

institutional investors with large shareholdings (respectively Hypothesis 3 and 4). I start with testing Hypothesis 3 using *BIG4* as independent variable for *Monitor* in equation (5). *BIG4* is equal to one if the bank is audited by Deloitte, PwC, EY, or KPMG, and zero otherwise. Table 6 column (1) reports the result of equation (5). The coefficient of *BIG4* is not significant. Before the Dodd-Frank Act, there is on average no difference in the level of earnings management for banks with a Big 4 auditor compared to banks with non-Big 4 auditors. The coefficient of *DFA* is significant and negative ($p<0.01$). The enactment of the Dodd-Frank Act is associated with less earnings management in all banks. The variable of interest, the coefficient of the interaction term *DFA * BIG4*, is also not significant. This means that the effect of the enactment of the Dodd-Frank Act is on average not different for banks with a Big 4 auditor, compared to before the Dodd-Frank Act and banks with a non-Big 4 auditor. In short, Table 6 gives insufficient evidence to support Hypothesis 3. The decline in earnings management is not more pronounced for banks with a Big 4 auditor following the Dodd-Frank Act.

There are some possible reasons why this research does not document that Big 4 auditors are more likely to restrict earnings management. First, as noted in Berglund et al. (2018), it is probable that my model does not sufficiently control for the financial condition of the bank. Larger auditors mostly have larger clients with a better financial health than smaller auditors. Firms in financial distress can be more likely to manage earnings to deceive the public about their underlying economic performance. The model I use only takes the financial condition into account with the control variable *Leverage*. Also, as banks operate in a highly monitored industry, Big 4 auditors are maybe less important in restricting earnings management (Kanagaretnam et al. 2010). Another reason is an endogeneity issue: it is not clear if a Big 4 auditor leads to less earnings management or that banks with less earnings management are more likely to hire Big 4 auditors. I address this issue in section 5.6.

Then I test Hypothesis 4 using *INST* as independent variable for *Monitor* in equation (5). *INST* equals one if the percentage institutional ownership is equal to or higher than the yearly sample median and zero otherwise. As shown in column (2) of Table 6, the coefficient of *INST* is negative and significant ($p<0.01$). Before the Dodd-Frank Act, banks that have more institutional investors with large shareholdings have on average less earnings management, compared to banks who do not have this extra monitoring. The coefficient of *DFA* is significant and negative ($p<0.01$). The enactment of the Dodd-Frank Act is associated with less earnings management in all banks. The coefficient of the interaction term *DFA * INST*, the variable of interest, is not significant. The relation between the Dodd-Frank Act and earnings management is on average not different for banks with institutional ownership with large shareholdings

Table 6 The Dodd-Frank effect on earnings management and influence of external monitoring

	(1) Monitor = BIG4		(2) Monitor = INST	
	|ALLP|	|ALLP| Residual < 0	|ALLP|	|ALLP| Residual < 0
DFA	– 0.055***	– 0.038***	– 0.060***	– 0.041***
	(– 4.95)	(– 3.19)	(– 5.06)	(– 3.27)
Bank size	0.004	– 0.013*	0.005	– 0.013*
	(0.44)	(– 1.74)	(0.57)	(– 1.73)
DFA * Bank size	– 0.021*	0.000	– 0.025**	– 0.001
	(– 1.79)	(0.03)	(– 2.51)	(– 0.06)
BIG4	– 0.005	– 0.007	– 0.004	– 0.006
	(– 0.85)	(– 1.36)	(– 0.81)	(– 1.26)
INST	– 0.010**	– 0.008*	– 0.013***	– 0.010**
	(– 2.27)	(– 1.90)	(– 2.76)	(– 2.17)
DFA * Monitor	**0.001**	**0.004**	**0.011**	**0.008**
	(0.13)	**(0.40)**	**(1.54)**	**(1.03)**
ΔGDP	– 0.317	– 0.363	– 0.310	– 0.354
	(– 1.05)	(– 1.03)	(– 1.03)	(– 1.01)
Leverage	0.075	– 0.045	0.079	– 0.042
	(0.87)	(– 0.62)	(0.92)	(– 0.58)
MTB	– 0.033***	– 0.027***	– 0.034***	– 0.027***
	(– 8.48)	(– 6.45)	(– 8.49)	(– 6.44)
Tier 1	– 0.002***	– 0.003***	– 0.002***	– 0.003***
	(– 2.94)	(– 4.10)	(– 2.95)	(– 4.09)
Constant	0.152*	0.240***	0.150*	0.238***
	(1.77)	(3.29)	(1.75)	(3.25)
Year fixed effects	yes	yes	yes	yes
Observations	9,378	5,090	9,378	5,090
Adjusted R^2	0.12	0.13	0.12	0.13

*, **, *** symbolize significance at the 10%, 5%, and 1% level (two-tailed), respectively

This table reports the results of equation (5). This model tests if the Dodd-Frank effect is more pronounced for banks with a Big 4 auditor (Hypothesis 3) or with more institutional investors with large shareholdings (Hypothesis 4), presented in respectively column (1) and (2). The right side of each column only tests income-increasing earnings management (see section 5.6). The dependent variable is multiplied by 100 for presentation purposes. The sample includes 9,378 bank-year observations with non-missing values from 2000 to 2017 after excluding non-listed banks. Only U.S. commercial banks (sic code 6020) and savings institutions (sic code 6035 and 6036) are included. Each year, all continuous variables except for Δ*GDP* are winsorized at 1% and 99% and all variables are described in Appendix B. The t-statistics in parentheses are based on cluster-robust standard errors at the bank-level.

compared to banks with institutional ownership with low shareholdings. So, based on Table 6, there is not enough evidence to support Hypothesis 4. The decline in earnings management is not more pronounced for banks with institutional investors with large shareholdings following the enactment of the Dodd-Frank Act.

There is one possible explanation for this result. Even though banks have a percentage of institutional ownership above the yearly sample median, this does not ultimately imply that

each institutional investor also has large shareholdings. Therefore, the variable *INST* maybe does not control for the extra monitoring of institutional investors with large shareholdings. I refer to section 5.6 for some additional measures which partly reduce this problem.

5.6 Robustness tests

In this section, I discuss the results of the robustness measures that are presented in section 4.1.4. For all models, I only show the results of the most relevant variables to be concise. First, I discuss the results of the robustness tests that apply to all models. I begin with the alternative measure for earnings management, namely income-increasing earnings management as dependent variable. To easily compare the results with the dependent variable that captures all earnings management, the results of income-increasing earnings management are displayed in the same tables for equation (3)-(5), respectively in the second column of Table 4-6. If I only look at income-increasing earnings management, the results changed. Now, the coefficient of *Bank size* is significant and negative ($p<0.1$ in all models), meaning that before the Dodd-Frank Act, there is on average less income-increasing earnings management in regional and large banks, compared to small banks. The Dodd-Frank Act is still associated with less income-increasing earnings management in all banks ($p<0.01$ in all models), but there is no additional decrease in income-increasing earnings management for regional and large banks after the Dodd-Frank Act, compared to before and small banks. A possible explanation for this result is the finding that there is already a difference in income-increasing earnings management for banks with a different size before the Dodd-Frank Act. Palmrose et al. (2004) find that the discovery of income-increasing earnings management is perceived worse by the market than the revelation of income-decreasing earnings management. Likewise, larger banks have a higher reputation to protect and therefore maybe engage in less income-increasing earnings management. The control variable *Size* is now also significant and negative ($p<0.1$) in equation (4) in Table 5 column (2), possibly reflecting the fact that larger banks are more monitored and thus have reduced incentives for income-increasing earnings management.

Furthermore, I test for all models if the results are robust for excluding the financial crisis years (2007-2009). For conciseness, I only show the results of equation (3) for the relevant variables. Appendix E Panel A shows that the coefficient of *DFA* is still significant and negative ($p<0.01$), suggesting that there is a reduction in earnings management after the Dodd-Frank Act compared to before. But the coefficient of the interaction term *DFA * Bank size* is not significant anymore, suggesting that there is no additional decrease in earnings management for regional and large banks after the Dodd-Frank Act, compared to before and small banks. Fan et al. (2019)

document that there is more earnings management in banks during the financial crisis. So, it is possible that I found an extra decrease in earnings management in section 5.3 for regional and large banks after the Dodd-Frank Act compared to before and small banks, but that this decrease is only found because there was more earnings management than usual beforehand. The results of the other models are untabulated for brevity. The interaction term *DFA * Bank size* is insignificant in all models after excluding the financial crisis years, despite controlling for GDP growth in the original models. The results of the other variables and models remain unchanged (significance and sign).

Second, I discuss the results of the robustness tests for specific models. I use one alternative measure for the independent variable *Close to CAP* that is used in equation (4) to test Hypothesis 2. Appendix E Panel B, column (1) reports the results using *CAPM1*. This is the ratio of the Tier 1 capital ratio divided by its minimum. Appendix E Panel B, column (2) reports the results using *CAPM3*. This is the total capital ratio divided by its minimum. Note that both *CAPM1* and *CAPM3* are centered at the cut-off point to be characterized as well-capitalized for a better interpretation. The coefficients of the variables *CAPM1* and *CAPM3* are significant and negative ($p<0.01$), meaning that before the Dodd-Frank Act, there is on average more earnings management for banks that are closer to the minimum capital requirements. The coefficient of the *DFA* is positive and significant ($p<0.01$). This means that on average, the Dodd-Frank Act leads to a reduction in earnings management for banks that have the minimum well-capitalized capital ratio. Both these results are also found using the original measure *Close to CAP*. However, the positive and significant ($p<0.01$) coefficient for the interaction term *DFA * CAPM* indicates that the decrease in earnings management following the Dodd-Frank Act is stronger for banks that are closer to violating the capital requirements. This is not in line with expectations, unless the increase in external monitoring, these banks face regulatory costs if their capital ratio drops below the regulatory minimum. It is likely that the less than well-capitalized banks use other methods than understating loan loss provisions to prevent violating the capital requirements and incurring the associated regulatory costs.

Moreover, I address a potential self-selection issue for Hypothesis 4 in equation (5) for the variable *BIG4*. Appendix E Panel C, column (1) reports the results of the probit model of auditor choice. The variables *ROA* and *LnLOANS* are significantly positively associated with *BIG4*, while *ROA*LOSS*, Δ*LOANS*, *Tier 1*, *LOANRATIO* and *NPLRATIO* are significantly negatively associated with *BIG4*. From this first-stage regression I obtain the *IMR* and include this variable as an extra independent variable in equation (5). Appendix E Panel C, column (2) shows that the coefficient of *IMR* is significant ($p<0.01$). This can suggest that there is a self-

selection issue in the original model. The results changed after including *IMR* in equation (5). The coefficients of the variables *Bank size* ($p<0.01$), *BIG4* ($p<0.01$) and *Leverage* ($p<0.05$) are now significantly positive. These results indicate that before the Dodd-Frank Act, there is on average more earnings management in regional and large banks compared to small banks; and for banks with a Big 4 auditor compared to banks with a non-Big 4 auditor. The results further show that more leveraged firms exhibit on average more earnings management. The variable of interest, the interaction term *DFA * BIG4*, is still insignificant. This is not in line with Chung et al. (2005), who find that Big 4 auditors constrain opportunistic earnings management. There are two potential explanations. This model still does not control for differences in the financial condition of the banks, except for *Leverage*. Also, maybe including the *IMR* is not enough to control for the endogenous auditor choice. Besides, there are some likely theoretical explanations from Lawrence et al. (2011). Because all audit firms, whether it is Big 4 or non-Big 4, must meet the same professional standards, they also must comply to the same quality. Auditors also sometimes go from a Big 4 to a non-Big 4 firm, so non-Big 4 firms benefit from the knowledge of the former Big 4 auditor.

Finally, I use two alternative measures for the independent variable institutional ownership (*INST*) that is used in equation (5) to test Hypothesis 4. Appendix E Panel D, column (1) reports the results using *C5*. *C5* is calculated as the number of shares held by the five institutional investors with the largest shareholdings, divided by the total number of common shares outstanding in the bank. Note that *C5* is mean-centered for a better interpretation. Appendix E Panel D, column (2) reports the results using *INST2*. This variable is coded one if the percentage of institutional ownership is above the yearly 75^{th} percentile and coded zero if it is below the 25^{th} percentile. Note that this reduces the sample size. The coefficients of the variables *C5* and *INST2* are significant and negative ($p<0.01$), meaning that before the Dodd-Frank Act, there is on average less earnings management for banks that have institutional investors with larger shareholdings. On the contrary to the expectation and original results, the interaction term for both alternative measures are positive and significant ($p<0.01$). These results suggest that the decrease in earnings management following the Dodd-Frank Act is on average smaller for banks that have more institutional owners with large shareholdings, compared to institutional investors with low shareholdings. The Dodd-Frank effect is thus on average stronger for banks with institutional investors with low shareholdings, possibly because they lack the monitoring that banks with institutional investors with large shareholdings do have before the Dodd-Frank Act. So, this result maybe implies that extra monitoring (as part of new regulation) is possibly more effective if there is less monitoring before the new regulation.

6. Conclusion and discussion

6.1 Conclusion

In this research, I examine if banks engage in less earnings management following the enactment of the Dodd-Frank Act in 2010. The DFA is an exogenous shock in the level of regulation. The provisions of the DFA affect banks' incentives for earnings management through stricter regulatory rules, more supervision and increased monitoring. The provisions of the DFA lead to more disclosure of information. This facilitates both regulators and other stakeholders to monitor and discipline the banks. The increase in scrutiny can come with negative consequences and hence reduce incentives for opportunistic behavior. The level of requirements and external monitoring increases with the asset thresholds of $10 billion and $50 billion of consolidated assets. I study earnings management of U.S. commercial banks before and after the enactment of the DFA for the period 2000-2017, using the absolute value of abnormal loan loss provisions as measure for earnings management. Subsequently, I look into the influence of the capital requirements and different monitoring parties on earnings management.

Comparing the Dodd-Frank effect on earnings management in regional and large banks on the one hand and small banks on the other hand, the results indicate that the DFA is associated with, on average, a stronger reduction in earnings management for regional and large banks. However, this finding is not robust for excluding the financial crisis years (2007-2009) and using the alternative measure income-increasing earnings management.

The results also suggest that before the DFA, there is more earnings management in banks that are close to the minimum capital ratio. Earnings management increases the capital ratio and can prevent regulatory costs and additional scrutiny. Nonetheless, I show that the DFA is associated with, on average, less earnings management for banks that are close to violating the capital requirements. Additional robustness tests even suggest that the reduction in earnings management is stronger for banks that are closer to violating the capital requirements.

I further analyse the influence of other monitoring parties on earnings management. I do not find sufficient evidence of a pre- or post-Dodd-Frank effect that Big 4 auditors restrict earnings management. I find similar results after applying the Heckman selection model, except that before the DFA, a Big 4 auditor is associated with more earnings management. Besides, I find that banks with extra monitoring of institutional investors with large shareholdings exhibit on average less earnings management, but I do not find an additional Dodd-Frank effect for those banks. Anyhow, robustness measures suggest that the Dodd-Frank effect is on average smaller for banks with institutional investors with large shareholdings.

6.2 Contribution

This research contributes to the existing literature about the consequences of the Dodd-Frank Act. For example, previous research find that the financial stability and market discipline improved following the DFA (Balasubramnian and Cyree 2014; Balasubramanyan et al. 2019). The results of this research reveal that the DFA leads to a reduction in bank earnings management. This insight contributes to the awareness of the consequences of the DFA on the accounting practice of bank managers.

I also add to the literature on the different effect of the Dodd-Frank Act on small, regional, or large banks. Bouwman et al. (2018) find that banks just below the $10 and $50 billion thresholds manage total assets to prevent additional regulatory costs. Leledakis and Pyrgiotakis (2019) show that there are more acquisitions among small banks after the DFA than before, compared to larger banks. I do not find conclusive evidence that the effect of the DFA is different for regional and large banks, compared to small banks. This finding adds to the knowledge of the question if the use of thresholds for regulation can pose different implications for the affected banks.

In addition, I contribute to the literature stream on the effect of regulation and external monitoring on earnings management in general. Leventis et al. (2011) show that the implementation of IFRS improves earnings quality of banks. I find that the DFA is associated with less earnings management. Other studies show that banks in countries with more powerful bank regulation and monitoring in general exhibit less earnings management (Fonseca and González 2008; Dal Maso et al. 2018). I show that the monitoring of institutional investors with large shareholdings reduces bank earnings management, but that bank regulation does not enhance this monitoring effect.

Lastly, I contribute to the literature about capital management. Moyer (1990) shows that banks that are close to breaching the minimum capital requirements, manage loan loss provisions to avoid regulatory costs. I find that the additional monitoring as a result of the DFA leads to a reduction in earnings management for banks closer to violating the capital requirement. This gives policy makers or accounting regulators the insight that monitoring maybe reduces the misuse of loan loss provisions for managing capital.

6.3 Limitations

This research is subject to some limitations. First, it is possible that there are other confounding events or regulatory changes that influence the results, despite the inclusion of control variables. For example, the finding that some of the results changed after excluding the

financial crisis years (2007-2009) could imply that some of the results are partly driven by the financial crisis instead of the enactment of the DFA.

Second, the results are not generalizable to other industries than the banking industry, still the use of specific accruals provides strong evidence of earnings management in the banking industry (McNichols 2000). However, the use of discretionary accruals as measure for opportunistic behavior has its downfall. In this study I assume that less earnings management is desirable. But the use of earnings management does not have to imply that the manager behaves opportunistic, the manager maybe conveys private information to market and hence reduces information asymmetry. Or, earnings management can be in line with the interests of some stakeholders (Beatty and Liao 2014). So, the use of discretionary accruals neglects the motivations for earnings management.

Third, all models have an adjusted R^2 of around 12 percent. This means that only 12 percent of the variation in the absolute value of abnormal loan loss provisions is explained by the independent variables. Therefore, my model is maybe not very representative and suffers from omitted correlated variable bias. There are potentially control variables that are correlated with the absolute value of abnormal loan loss provisions (or also with the enactment of the Dodd-Frank Act) that are now not included. For instance, corporate governance variables or variables that capture the financial position of the firm (McNichols and Stubben 2018).

Lastly, due to two reasons it is possible that I misclassify some banks as well-capitalized while they are actually not. Banks are not well-capitalized, among other things, if the Tier 1 leverage ratio is lower than 5% (6.5% for large banks). Because of the lack of sufficient data, the Tier 1 leverage ratio is not included in this research. Moreover, the Federal Reserve Board can increase the capital requirements for specific banks. I do not account for individual differences in the capital requirements.

6.4 Future research

Based on the limitations, I have some recommendations for future research. Future research can attempt to make sure that the findings do not relate to other factors than the Dodd-Frank Act. One way of doing that is to use a control group that is not affected by the enactment of the Dodd-Frank Act (Beatty and Liao 2014), like similar listed banks outside the United States. Future research can focus as well on other measures of opportunistic behavior to increase the strength of the evidence (McNichols and Stubben 2018). Examples are restatements or the propensity to avoid losses. In addition, researchers can examine if there is more earnings management after the recently changed provisions of the Dodd-Frank Act in 2018. The

loosened requirements of the Dodd-Frank Act lead to less monitoring and possibly to more earnings management. If this is the case, it substantiates the finding that there is less earnings management as a result of the Dodd-Frank Act. Also, instead of looking at the level of institutional ownership, one can consider taking into account the different types of institutional investors. Demiralp et al. (2011) mention that some investors are more likely to monitor the firm than others. My last suggestion is to control for client characteristics that explains the auditor choice by adopting a propensity-score matching procedure (Lawrence et al. 2011; Eshleman and Guo 2014).

6.5 Implications

Nonetheless the limitations, this research has some implications for bank regulators, policy makers and investors. I find that banks with a higher capital ratio and banks with institutional investors with large shareholdings engage in less earnings management, but I do not find that Big 4 auditors restrict earnings management. This finding gives a possible insight about the role of auditors. It can mean that better capitalization and the monitoring of institutional investors with large shareholdings may act as substitutes for the monitoring of Big 4 auditors. This research also gives a new insight into the consequences of the Dodd-Frank Act. The aim of the Dodd-Frank Act is to enhance the financial stability of the financial market. Gao et al. (2018) find that the market doubts the effectiveness of the DFA. Both regulators and investors need to be aware that regulation can impose unintended consequences. Even though the DFA may not result in the intended desired effect (higher financial stability and lower risk-taking), it can lead to other possible desirable effects. I find that that the Dodd-Frank Act is associated with less earnings management in banks. Both investors, auditors and regulators are interested in credible financial statements. In light of the recent developments in rolling back some DFA provisions, this finding provides an insight for policy makers in the consequences of the DFA that a rollback will possibly undo. It remains unclear what specific provisions of the Dodd-Frank Act are associated with the reduction in earnings management.

7. Reference list

Acharya, V. V., and M. Richardson. 2012. Implications of the Dodd-Frank Act. *Annual Review of Financial Economics* 4: 1-38.

Ahmed, A. S., C. Takeda, and S. Thomas. 1999. Bank loan loss provisions: a reexamination of capital management, earnings management and signaling effects. *Journal of Accounting and Economics* 28: 1-25.

Anandarajan, A., I. Hasan, and A. Lozano-Vivas. 2003. The role of loan loss provisions in earnings management, capital management, and signalling: The Spanish experience. *Advances in International Accounting* 16: 45-65.

Baily, M. N., A. Klein, and J. Schardin. 2017. The Impact of the Dodd-Frank Act on Financial Stability and Economic Growth. *RSF: The Russell Sage Foundation Journal of the Social Sciences* 3 (1): 20-47.

Balasubramanyan, L., N. D. Daniel, J. G. Haubrich, and L. Naveen. 2019. Causal Impact of Risk Oversight Functions on Bank Risk: Evidence from a Natural Experiment. *FRB of Cleveland Working Paper* No. 19-01.

Balasubramanyan, L., and C. Madias. 2015. Loan-Loss Provisioning. *Federal Reserve Bank of Cleveland Economic Trends*.

Balasubramnian, B., and K. B. Cyree. 2014. Has market discipline on banks improved after the Dodd–Frank Act? *Journal of Banking & Finance* 41: 155-166.

Balla, E., M. J. Rose, and J. Romero. 2012. Loan Loss Reserve Accounting and Bank Behavior. *Federal Reserve Bank of Richmond Economic Brief* 12-03.

Barth, J. R., and S. M. Miller. 2017. A Primer on the Evolution and Complexity of Bank Regulatory Capital Standards. *Working Paper*.

Beatty, A., and S. Liao. 2014. Financial accounting in the banking industry: A review of the empirical literature. *Journal of Accounting and Economics* 58 (2-3): 339-383.

Beaver, W., C. Eger, S. Ryan, and M. Wolfson. 1989. Financial Reporting, Supplemental Disclosures, and Bank Share Prices. *Journal of Accounting Research* 27 (2): 157-178.

Belsley, D. A., E. Kuh, and R. E. Welsch. 1980. *Regression Diagnostics: Identifying Influential Data and Sources of Collinearity*. Wiley.

Berglund, N. R., J. D. Eshleman, and P. Guo. 2018. Auditor Size and Going Concern Reporting. *Auditing: A Journal of Practice & Theory* 37 (2): 1-25.

Bikker, J. A., and P. A. J. Metzemakers. 2005. Bank provisioning behaviour and procyclicality. *Journal of International Financial Markets, Institutions and Money* 15 (2): 141-157.

Bindal, S., C. H. S. Bouwman, S. S. Hu, and S. A. Johnson. 2020. Bank regulatory size thresholds, merger and acquisition behavior, and small business lending. *Journal of Corporate Finance* 62: 1-36.

Bischof, J., U. Brüggemann, and H. Daske. 2019. Asset Reclassifications and Bank Recapitalization during the Financial Crisis. *Working Paper*.

Bouwman, C. H. S., S. S. Hu, and S. A. Johnson. 2018. Differential bank behaviors around the Dodd–Frank Act size thresholds. *Journal of Financial Intermediation* 34: 47-57.

Breusch, T. S., and A. R. Pagan. 1979. A Simple Test for Heteroscedasticity and Random Coefficient Variation. *Econometrica* 47 (5): 1287-1294.

Brown, P., J. Preiato, and A. Tarca. 2014. Measuring Country Differences in Enforcement of Accounting Standards: An Audit and Enforcement Proxy. *Journal of Business Finance & Accounting* 41 (1-2): 1-52.

Burgstahler, D. C., L. Hail, and C. Leuz. 2006. The Importance of Reporting Incentives: Earnings Management in European Private and Public Firms. *The Accounting Review* 81 (5): 983-1016.

Burns, N., S. Kedia, and M. Lipson. 2010. Institutional ownership and monitoring: Evidence from financial misreporting. *Journal of Corporate Finance* 16 (4): 443-455.

Bushman, R. M., and C. D. Williams. 2012. Accounting discretion, loan loss provisioning, and discipline of Banks' risk-taking. *Journal of Accounting and Economics* 54 (1): 1-18.

Chung, R., M. Firth, and J-B. Kim. 2002. Institutional monitoring and opportunistic earnings management. *Journal of Corporate Finance* 8 (1): 29-48.

Chung, R., M. Firth, and J-B. Kim. 2005. Earnings management, surplus free cash flow, and external monitoring. *Journal of Business Research* 58 (6): 766-776.

Collins, J. H., D. A. Shackelford, and J. M. Wahlen. 1995. Bank Differences in the Coordination of Regulatory Capital, Earnings, and Taxes. *Journal of Accounting Research* 33 (2): 263-291.

Cornett, M. M., J. J. McNutt, and H. Tehranian. 2009. Corporate governance and earnings management at large U.S. bank holding companies. *Journal of Corporate Finance* 15 (4): 412-430.

Cortés, K. R., Y. Demyanyk, L. Lei, E. Loutskina, and P. E. Strahan. 2020. Stress tests and small business lending. *Journal of Financial Economics* 136 (1): 260-279.

Dal Maso, L., K. Kanagaretnam, G. J. Lobo, and S. Terzani. 2018. The influence of accounting enforcement on earnings quality of banks: Implications of bank regulation and the global financial crisis. *Journal of Accounting and Public Policy* 37 (5): 402-419.

DeFond, M., and J. Zhang. 2014. A review of archival auditing research. *Journal of Accounting and Economics* 58 (2-3): 275-326.

Demiralp, I., R. D'Mello, F. P. Schlingermann, and V. Subramaniam. 2011. Are there monitoring benefits to institutional ownership? Evidence from seasoned equity offerings. *Journal of Corporate Finance* 17 (5): 1340-1359.

Desai, H., C. E. Hogan, and M. S. Wilkins. 2006. The Reputational Penalty for Aggressive Accounting: Earnings Restatements and Management Turnover. *The Accounting Review* 81 (1): 83-112.

Dimitrov, V., D. Palia, and L. Tang. 2015. Impact of the Dodd-Frank act on credit ratings. *Journal of Financial Economics* 115 (3): 505-520.

Ediz, T., I. Micheal, and W. Perraudin. 1998. The Impact of Capital Requirements on U.K. Bank Behaviour. *Economic Policy Review* 4 (3): 15-22.

Erkens, M. H. R., Y. Gan, and B. Yurtoglu. 2018. Not all clawbacks are the same: Consequences of strong versus weak clawback provisions. *Journal of Accounting and Economics* 66: 291-317.

Eshleman, J. D., and P. Guo. 2014. Do Big 4 Auditors Provide Higher Audit Quality after Controlling for the Endogenous Choice of Auditor? *Auditing: A Journal of Practice & Theory* 33 (4): 197-219.

Fan, Y., Y. Jiang, X. Zhang, and Y. Zhou. 2019. Women on boards and bank earnings management: From zero to hero. *Journal of Banking & Finance* 107: 1-21.

Federal Reserve Bank of New York. 2018. Banking Research Datasets 2018-4. Retrieved May 8, 2020 from https://www.newyorkfed.org/research/banking_research/datasets.html

Fein, M. L. 2010. Dodd-Frank Wall Street Reform and Consumer Protection Act. *Working Paper*.

Fields, T. D., Z. L. Lys, and L. Vincent. 2001. Empirical research on accounting choice. *Journal of Accounting and Economics* 31 (1-3): 255-307.

Flannery, M. J., S. H. Kwan, and M. Nimalendran. 2004. Market evidence on the opaqueness of banking firms' assets. *Journal of Financial Economics* 71 (3): 419-460.

Fonseca, A. R., and F. González. 2008. Cross-country determinants of bank income smoothing by managing loan-loss provisions. *Journal of Banking & Finance* 32 (2): 217-228.

Gao, Y., S. Liao, and X. Wang. 2018. Capital markets' assessment of the economic impact of the Dodd–Frank Act on systemically important financial firms. *Journal of Banking & Finance* 86: 204-223.

Healy, P. M., and K. G. Palepu. 2001. Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics* 31 (1-3): 405-440.

Healy, P. M., and J. M. Wahlen. 1999. A Review of the Earnings Management Literature and Its Implications for Standard Setting. *Accounting Horizons* 13 (4): 365-383.

Heckman, J. J. 1979. Sample Selection Bias as a Specification Error. *Econometrica* 47 (1): 153-161.

Huizinga, H., and L. Laeven. 2012. Bank valuation and accounting discretion during a financial crisis. *Journal of Financial Economics* 106 (3): 614-634.

Irani, R. M., and D. Oesch. 2013. Monitoring and corporate disclosure: Evidence from a natural experiment. *Journal of Financial Economics* 109 (2): 398-418.

Jones, J. J. 1991. Earnings Management During Import Relief Investigations. *Journal of Accounting Research* 29 (2): 193-228.

Kanagaretnam, K., C. Y. Lim, and G. J. Lobo. 2010. Auditor reputation and earnings management: International evidence from the banking industry. *Journal of Banking & Finance* 34 (10): 2318-2327.

Kim, M-S., and W. Kross. 1998. The impact of the 1989 change in bank capital standards on loan loss provisions and loan write-offs. *Journal of Accounting and Economics* 25 (1): 69-99.

Koba, M. (2013, April 30). Dodd-Frank Act: CNBC Explains. *CNBC.* Retrieved January 28, 2020 from https://www.cnbc.com/id/47075854

Lawrence, A., M. Minutti-Meza, and P. Zhang. 2011. Can Big 4 versus Non-Big 4 Differences in Audit-Quality Proxies Be Attributed to Client Characteristics? *The Accounting Review* 86 (1): 259-286.

Leledakis, G. N., and E. G. Pyrgiotakis. 2019. U.S. bank M&As in the post-Dodd–Frank Act era: Do they create value? *Journal of Banking & Finance* (forthcoming).

Lennox, C. 1999. Are large auditors more accurate than small auditors? *Accounting and Business Research* 29 (3): 217-227.

Leventis, S., P. E. Dimotropoulos, and A. Anandarajan. 2011. Loan Loss Provisions, Earnings Management and Capital Management under IFRS: The Case of EU Commercial Banks. *Journal of Financial Services Research* 40 (1-2): 103-122.

Lewellen, J. 2011. Institutional investors and the limits of arbitrage. *Journal of Financial Economics* 102 (1): 62-80.

Luo, X., R. Zhang, W. Zhang, and J. Aspara. 2014. Do institutional investors pay attention to customer satisfaction and why? *Journal of the Academy of Marketing Science* 42: 119-136.

Mason, J. R., J. D. Balcombe, and W. S. Dalrymple. 2018. Financial Supervision and Regulation in the US. *Study for the Committee on Economic and Monetary Affairs, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, Luxembourg.*

McNichols, M. F. 2000. Research design issues in earnings management studies. *Journal of Accounting and Public Policy* 19 (4-5): 313-345.

McNichols, M. F., and S. R. Stubben. 2018. Research Design Issues in Studies Using Discretionary Accruals. *Abacus* 54 (2): 227-246.

Mehran, H., A. D. Morrison, and J. D. Shapiro. 2011. Corporate Governance and Banks: What Have We Learned from the Financial Crisis? *Federal Reserve Bank of New York Staff Reports* 502.

Moutsianas, K. A., and K. Kosmidou. 2016. Bank earnings volatility in the UK: Does size matter? A comparison between commercial and investment banks. *Research in International Business and Finance* 38: 137-150.

Moyer, S. E. 1990. Capital adequacy ratio regulations and accounting choices in commercial banks. *Journal of Accounting and Economics* 13 (2): 123-154.

Murphy, K. J. 2013. Executive Compensation: Where We Are, and How We Got There. *Handbook of the Economics of Finance* Volume 2 Part A Chapter 4: 211-356.

O'Brien, R. M. 2007. A Caution Regarding Rules of Thumb for Variance Inflation Factors. *Quality & Quantity* 41 (5): 673-690.

Palmrose, Z-V., V. J. Richardson, and S. Scholz. 2004. Determinants of market reactions to restatement announcements. *Journal of Accounting and Economics* 37 (1): 59-89.

Peasnell, K. V., P. F. Pope, and S. Young. 2000. Detecting earnings management using cross-sectional abnormal accruals models. *Accounting and Business Research* 30 (4): 313-326.

Pierret, D., and R. Steri. 2017. Stressed Banks. *Swiss Finance Institute Research Paper* 17-58.

Piotroski, J. D., and B. T. Roulstone. 2004. The Influence of Analysts, Institutional Investors, and Insiders on the Incorporation of Market, Industry, and Firm-Specific Information into Stock Prices. *The Accounting Review* 79 (4): 1119-1151.

Ryan, S. G. 2008. Accounting in and for the Subprime Crisis. *The Accounting Review* 83 (6): 1605-1638.

Scott, W. R. 2015. *Financial Accounting Theory*. 7th ed. Pearson.

Slovik, P. 2012. Systemically Important Banks and Capital Regulation Challenges. *OECD Economics Department Working Papers* No. 916.

U.S. Bureau of Economic Analysis. (2020, April 29). Table 1.1.5. Gross Domestic Product. Retrieved May 7, 2020 from https://apps.bea.gov/iTable/iTable.cfm?reqid=19&step=2#reqid=19&step=2&isuri=1&1921=survey

U.S. Congress. (2010, July 21). Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, Pub.L. 111-203, 124 Stat. 1376, enacted July 21, 2010. Retrieved January 28, 2020 from https://www.congress.gov/111/plaws/publ203/PLAW-111publ203.pdf

U.S. Congress. (2018, May 24). Economic Growth, Regulatory Relief, and Consumer Protection Act of 2018, Pub.L. 115-174, 132 Stat. 1296, enacted May 24, 2018. Retrieved March 20, 2020 from https://www.congress.gov/115/plaws/publ174/PLAW-115publ174.pdf

Wahlen, J. M. 1994. The Nature of Information in Commercial Bank Loan Loss Disclosures. *The Accounting Review* 69 (3): 455-478.

Watts, R. L., and J. L. Zimmerman. 1990. Positive Accounting Theory: A Ten Year Perspective. *The Accounting Review* 65 (1): 131-156.

Werner, E. (2018, May 24). Trump signs law rolling back post-financial crisis banking rules. *Washington Post*. Retrieved January 29, 2020 from https://www.washingtonpost.com/business/economy/trump-signs-law-rolling-back-post-financial-crisis-banking-rules/2018/05/24/077e3aa8-5f6c-11e8-a4a4-c070ef53f315_story.html

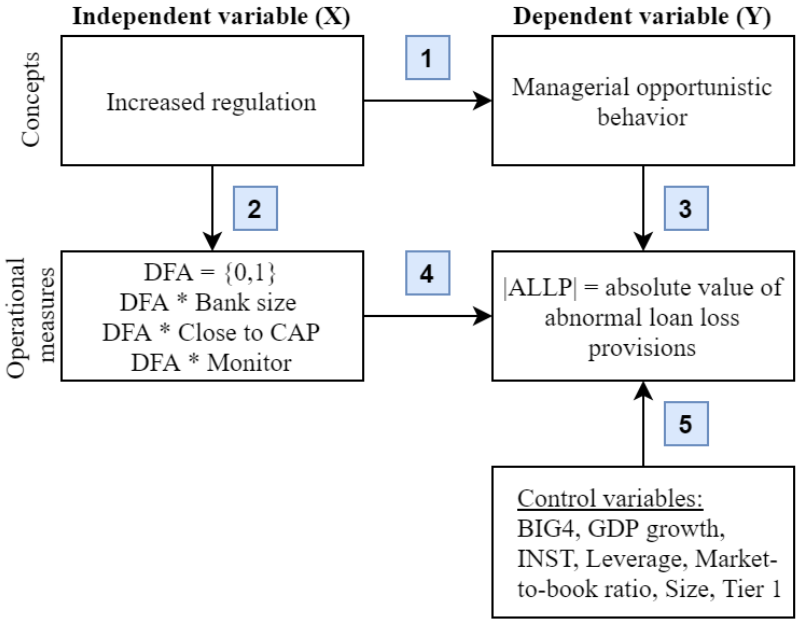
Wiedman, C. I., and C. Zhu. 2018. Do the SEC Whistleblower Provisions of Dodd Frank Deter Aggressive Financial Reporting? *Working Paper*.

Wilmarth Jr., A. E. 2011. The Dodd-Frank Act: A Flawed and Inadequate Response to the Too-Big-To-Fail Problem. *Oregon Law Review* 89: 951-1058.

Wongsunwai, W. 2013. The Effect of External Monitoring on Accrual-Based and Real Earnings Management: Evidence from Venture-Backed Initial Public Offerings. *Contemporary Accounting Research* 30 (1): 296-324.

8. Appendix

Appendix A Predictive validity framework



Appendix B Variables definition

Variable	Definition [WRDS Mnemonics]	Data source
Dependent variable		
|*ALLP*|	The absolute value of the abnormal part of the loan loss provisions	Equation (2)
BEGLLA	Beginning loan loss allowance is calculated as the previous loan loss allowance [rcl] divided by previous total assets [at]	Compustat Bank
Δ*LOANS*	Change from previous fiscal year to the current fiscal year in the total value of loans [lntal], scaled by previous total assets [at]	Compustat Bank
Δ*NPL*	Change from previous fiscal year to the current fiscal year in the nonperforming loans [npat], scaled by previous total assets [at]	Compustat Bank
LCO	Net charge-offs [nco] divided by previous total assets [at]	Compustat Bank
LLP	Loan loss provisions [pll] divided by previous total assets [at]	Compustat Bank
LOANS	Total value of loans [lntal] divided by previous total assets [at]	Compustat Bank
NPL	Nonperforming loans [npat] divided by previous total assets [at]	Compustat Bank
Independent variable		
Bank size	Bank size is equal to 1 if the bank is a regional bank (consolidated assets between $10 and $50 billion) or a large bank (consolidated assets above $50 billion), and 0 otherwise. This variable is measured using the total assets [at] at fiscal year-end.	Compustat Bank
BIG4	Big 4 auditor [auditor_fkey] equals 1 if the bank is audited by Deloitte, PwC, EY, or KPMG, and 0 otherwise	Audit Analytics
Close to CAP	Before 2015, close to capital requirements equals 1 if the bank's Tier 1 capital ratio [capr1] or total capital ratio [capr3] is less than 6% and 10% respectively, and 0 otherwise. Since 2015, close to capital requirements equals 1 if the bank's Tier 1 capital ratio or total capital ratio is less than 8% and 10% respectively, and 0 otherwise.	Compustat Bank
DFA	Dodd-Frank Act is equal to 1 for the years [fyear] following the Dodd-Frank Act (from 2011 onwards), and 0 otherwise	Compustat Bank
INST	Institutional ownership equals 1 if the percentage of institutional ownership is equal to or higher than the yearly sample median, and 0 otherwise. The percentage of institutional ownership is the ratio of number of shares held by institutional investors [instown] scaled by the total number of common shares outstanding in the bank [csho].	Thomson Reuters; Compustat Bank
Control variable		
Δ*GDP*	GDP growth is measured as the percentage change in annual Gross Domestic Product (GDP)	U.S. Bureau of Economic Analysis
Leverage	Leverage is measured as total liabilities [lt] to total assets [at]	Compustat Bank
MTB	Market-to-book ratio calculated as the market value of equity [csho*prcc_f] scaled by the book value of common equity [ceq], both at the end of the fiscal year	Compustat Bank; Compustat
Size	Size is measured as the natural logarithm of total assets [at]	Compustat Bank
Tier 1	Tier 1 capital ratio [capr1] is the ratio of Tier 1 capital to risk-weighted assets	Compustat Bank

Appendix C Pairwise correlation matrix

Variable	1	2	3	4	5	6	7	8	9	10
1 |ALLP|	1									
2 Bank size	– 0.044***	1								
3 BEGLLA	0.340***	– 0.015	1							
4 BIG4	– 0.067***	0.407***	– 0.023**	1						
5 Close to CAP	0.165***	– 0.030***	0.135***	– 0.042***	1					
6 DFA	– 0.083***	0.053***	0.138***	– 0.110***	– 0.054***	1				
7 ΔGDP	– 0.191***	– 0.011	– 0.095***	0.069***	– 0.092***	– 0.059***	1			
8 ΔLOANS	– 0.001	– 0.035***	– 0.208***	– 0.018*	– 0.073***	– 0.025**	0.217***	1		
9 ΔNPL	0.244***	– 0.017*	– 0.128***	– 0.038***	0.155***	– 0.304***	– 0.309***	0.057***	1	
10 INST	– 0.057***	0.241***	– 0.041***	0.354***	– 0.064***	0.001	– 0.001	0.015	– 0.010	1
11 LCO	– 0.470***	– 0.057***	– 0.575***	0.003	– 0.270***	0.052***	0.348***	0.311***	– 0.206***	0.010
12 Leverage	0.048***	– 0.041***	0.096***	0.056***	0.254***	– 0.233***	0.020**	– 0.060***	0.096***	– 0.087***
13 LLP	0.528***	0.038***	0.391***	– 0.018*	0.286***	– 0.164***	– 0.404***	– 0.187***	0.424***	– 0.017*
14 LOANS	0.086***	– 0.130***	– 0.006	– 0.132***	– 0.010	– 0.054***	0.080***	**0.744*** **	0.156***	– 0.036***
15 MTB	– 0.232***	0.122***	– 0.161***	0.248***	– 0.115***	– 0.209***	0.376***	0.212***	– 0.146***	0.122***
16 NPL	0.453***	– 0.064***	0.505***	– 0.152***	0.276***	0.100***	– 0.369***	– 0.271***	0.396***	– 0.109***
17 Size	– 0.071***	**0.733*** **	0.034***	0.538***	– 0.046***	0.146***	– 0.041***	– 0.011	– 0.015	0.450***
18 Tier 1	– 0.062***	– 0.107***	– 0.008	– 0.130***	– 0.273***	0.225***	0.006	– 0.068***	– 0.154***	– 0.051***

Variable	11	12	13	14	15	16	17	18
11 LCO	1							
12 Leverage	– 0.153***	1						
13 LLP	**– 0.888*** **	0.172***	1					
14 LOANS	0.126***	– 0.024**	0.002	1				
15 MTB	0.317***	0.171***	– 0.302***	0.065***	1			
16 NPL	– 0.669***	0.097***	0.644***	– 0.069***	– 0.440***	1		
17 Size	– 0.094***	0.009	0.063***	– 0.136***	0.224***	– 0.062***	1	
18 Tier 1	0.118***	– 0.587***	– 0.160***	– 0.232***	– 0.051***	– 0.060***	– 0.137***	1

*, **, *** symbolize significance at the 10%, 5%, and 1% level (two-tailed), respectively

This table presents the pairwise correlations of the variables (see Appendix B) for the ALLP tests. Correlations above 0.700 or under – 0.700 are bolded.

Appendix D Test linear regression assumptions

Panel A: Multicollinearity test	
Equation (1)	Variance Inflation Factor
BEGLLA	1.96
LCO	2.18
ΔLOANS	2.61
ΔNPL	1.54
LOANS	2.47
NPL	2.41
Mean VIF	2.19
Panel B: Breusch-Pagan / Cook-Weisberg Chi^2-test for heteroskedasticity (p-value)	
Equation (1)	8,889.84***
	(0.000)
Equation (3)	1,397.22***
	(0.000)
Equation (4)	1,564.87***
	(0.000)
Equation (5): BIG4	1,392.69***
	(0.000)
Equation (5): INST	1,402.48***
	(0.000)

*, **, *** symbolize significance at the 10%, 5%, and 1% level (two-tailed), respectively

Panel A presents the multicollinearity tests for equation (1), based on the Variance Inflation Factor (VIF) measure. A VIF-value greater than 5 or 10 indicates a multicollinearity problem. Panel B presents the Breusch-Pagan / Cook-Weisberg Chi^2-test for heteroskedasticity, a significant Chi^2-statistic means that there is a heteroskedasticity problem.

Appendix E Robustness tests

Panel A: Hypothesis 1 without financial crisis years (2007-2009)	
	|ALLP|
DFA	– 0.060***
	(– 5.27)
Bank size	– 0.009
	(– 1.16)
DFA * Bank size	**– 0.009**
	(– 0.88)
Control variables	yes
Year fixed effects	yes
Observations	7,747
Adjusted R^2	0.08

Panel B: Hypothesis 2 using *MCAP* instead of *Close to CAP*			
	|ALLP|		|ALLP|
DFA	– 0.100***	DFA	– 0.075***
	(– 5.76)		(– 6.11)
MCAP1	– 0.004***	MCAP3	– 0.023***
	(– 4.63)		(– 4.47)
DFA * MCAP1	**0.004*** **	**DFA * MCAP3**	**0.028*** **
	(3.35)		**(4.18)**
Control variables	yes	Control variables	yes
Year fixed effects	yes	Year fixed effects	yes
Observations	9,378	Observations	9,378
Adjusted R^2	0.12	Adjusted R^2	0.12

Panel C: Hypothesis 3 using *IMR* from probit model auditor choice			
	BIG4		|ALLP|
ROA	20.842***	DFA	– 0.035***
	(6.92)		(– 3.23)
ROA * LOSS	– 22.300***	Bank size	0.045***
	(– 5.36)		(4.92)
LnLOANS	0.559***	DFA * Bank size	– 0.025**
	(42.38)		(– 2.16)
ΔLOANS	– 0.629***	BIG4	0.016***
	(– 4.46)		(2.78)
Tier 1	– 0.058***	**DFA * BIG4**	**– 0.001**
	(– 11.59)		**(– 0.11)**
LOANRATIO	– 2.749***	**IMR**	**0.059*** **
	(– 19.69)		**(9.92)**
NPLRATIO	– 5.286***		
	(– 8.75)		
Constant	– 1.766***		
	(– 11.95)	Control variables	yes
		Year fixed effects	yes
Observations	9,378	Observations	9,378
Pseudo R^2	0.28	Adjusted R^2	0.14

(continued on next page)

Panel D: Hypothesis 4 using *C5* and higher cut-off point to classify institutional investors with large shareholdings (*INST2*), instead of *INST*			
	|ALLP|		|ALLP|
DFA	– 0.052***	DFA	– 0.060***
	(– 4.51)		(– 3.28)
Bank size	0.006	Bank size	0.007
	(0.65)		(0.77)
DFA * Bank size	– 0.029***	DFA * Bank size	– 0.042***
	(– 2.97)		(– 3.29)
C5	– 0.065***	INST2	– 0.021***
	(– 2.61)		(– 2.92)
DFA * C5	**0.099*** **	**DFA * INST2**	**0.032*** **
	(2.59)		**(2.81)**
Control variables	yes	Control variables	yes
Year fixed effects	yes	Year fixed effects	yes
Observations	9,378	Observations	4,704
Adjusted R^2	0.12	Adjusted R^2	0.12

*, **, *** symbolize significance at the 10%, 5%, and 1% level (two-tailed), respectively

This table reports the robustness results. Panel A presents the robustness test for Hypothesis 1 using equation (3). This model tests if earnings management is lower after the Dodd-Frank Act, especially for larger banks. Now, the financial crisis years (2007-2009) are excluded from the sample. Panel B presents the robustness test for Hypothesis 2 using equation (4). This model examines if the Dodd-Frank Act has an effect on earnings management for banks that are (close) to violating the capital requirements. The variable *Close to CAP* is replaced by *MCAP1* in the first column and by *MCAP3* in the second column. *MCAP1* is the Tier 1 capital ratio divided by its minimum. *MCAP3* is the total capital ratio divided by its minimum. *MCAP1* and *MCAP3* are both centered at the cut-off point to be classified as well-capitalized (see footnote 4) for better interpretable coefficients. Panel C presents the robustness test for Hypothesis 3. This model tests if the Dodd-Frank effect is more pronounced for banks with a Big 4 auditor. The first column presents the results of the probit model of auditor choice, see equation (6). This is the first stage of the Heckman selection model (1979). In the second column, the obtained Inverse Mills Ratio (*IMR*) from this model is included as additional independent variable in equation (5). This is the second stage of the Heckman selection model (1979). Panel D presents the robustness test for Hypothesis 4 using equation (5). This model tests if the Dodd-Frank effect is more pronounced for banks with more institutional investors with large shareholdings. The variable *INST* is replaced by *C5* in the first column and by *INST2* in the second column. *C5* is the number of shares held by the five institutional investors with the largest shareholdings, divided by the total number of common shares outstanding in the bank. I mean-center *C5* for better interpretable coefficients. *INST2* equals 1 if the percentage of institutional ownership is equal to or higher than the yearly 75th percentile and is 0 if it is equal to or lower than the 25th percentile. The dependent variable |*ALLP*| is multiplied by 100 for presentation purposes, and the control variables are untabulated. The sample includes 9,378 bank-year observations with non-missing values from 2000 to 2017 after excluding non-listed banks. Only U.S. commercial banks (sic code 6020) and savings institutions (sic code 6035 and 6036) are included. Each year, all continuous variables except for Δ*GDP* are winsorized at 1% and 99% and all other variables are described in Appendix B. The t-statistics in parentheses are based on cluster-robust standard errors at the bank-level, except in the first column of Panel C.