Bank earnings management and income smoothing using commission and fee income

A European context

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Abstract

Purpose – The purpose of this paper is to investigate whether European banks use commission and fee income (CF) to smooth reported earnings or to persistently increase reported earnings as an income-increasing earnings management strategy.

Design/methodology/approach – The author tests the income-smoothing hypothesis following the approach of Stubben (2010) and Ahmed *et al.* (1999).

Findings – The author finds that European banks use CF to smooth reported earnings and this behaviour is pronounced among non-too-big-to-fail (NTBTF) European banks compared to too-big-to-fail (TBTF) European banks. The author also finds a positive and significant correlation between interest income and non-interest income (CF) indicating increased systematic risk due to reduced diversification benefits. The author also finds that the CF of NTBTF banks is procyclical with fluctuating economic conditions but not for TBTF banks. Also, the author finds evidence for income-increasing earnings management in the post-crisis period, for larger European banks and when banks have higher *ex post* interest income, implying that the propensity to engage in income-increasing earnings management significantly depends on bank size and *ex post* interest margin considerations. The findings have policy implications.

Originality/value – The author examines alternative financial numbers that banks use to manage earnings. The author focusses on income smoothing via CF among European banks, a context that has not been explored in the literature.

Keywords Earnings management, Income smoothing, Diversification, European banks, Non-interest income, Systematic risk

Paper type Research paper

1. Introduction

The question I address is whether European banks use commission and fee income (CF) to manage reported earnings. I focus on two types of earnings management strategy: "income smoothing" and "income-increasing", and ask a straightforward question: do banks use CF to smooth earnings (so that reported earnings are never too high or too low) or to persistently increase earnings?

CF is a component of bank's non-interest income and one way to test the relationship between non-interest income and bank earnings is to examine the relationship between "earnings before non-interest income" and "one component" of non-interest income. A positive relationship would suggest that banks use that component of non-interest income to increase reported earnings while a negative relationship would suggest that banks use that component of non-interest income to smooth earnings so that earnings are never too high or too low. Accordingly, I draw inference from the statistical relationship between "CF" and "bank earnings before commission and fee income" (EBCF).

I focus on CF (a major component of non-interest income) because the literature suggests that CF brings some diversification benefits to banks and also boosts shortfall in bank earnings (DeYoung and Roland, 2001; DeLong, 2001; Stiroh, 2004; Stiroh and Rumble, 2006).

JEL Classification — G21, G28, L25

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This study differs from prior studies because I focus on the relationship between "CF" and "EBCF" – dimensions of bank earnings management that has not been explored in the bank diversification literature. I focus on this relationship to detect whether banks use non-interest income to smooth reported earnings over time or to increase reported earnings.

Assuming that banks engage in fee-generating non-depository activities to persistently increase their overall profitability, the analysis in this study aims to provide some insights about whether the increase in bank profit is achieved through income-increasing earnings management. On the other hand, assuming that banks engage in non-depository activities to smooth bank profit over time, I aim to gain some insight about whether persistent bank profitability is achieved through smoothing income over time. The analysis follows prior studies by incorporating "net interest income" (NII) variable into the model used in this study to observe whether there are diversification advantages to be derived from the association between interest income and non-interest income represented as CF.

Using individual bank data from 2004 to 2014 for European banks, I find that European banks use CF to smooth reported earnings and to increase earnings depending on the type of bank and other considerations. I also find that CF is positively correlated with interest income and suggests that engaging in activities that generate non-interest income (proxy by CF) do not yield its intended diversification benefits for European banks but rather increases bank's systematic risk. I compare too-big-to-fail (TBTF) and non-too-big-to-fail (NTBTF) European banks and find that European NTBTF banks use CF to smooth reported earnings and their CF is procyclical with fluctuating economic conditions.

The contribution of the study is threefold. First, this study contributes to the bank earnings management literature. By examining the case of CF, I aim to provide insights on alternative financial/accounting numbers that bank managers can exploit to manage reported earnings particularly in the post-financial crisis period when strict disclosure rules made it difficult for banks to use accruals to manage reported earnings. Second, this study also contributes to the literature on bank diversification. By controlling for bank's NII in this analysis, I provide insight on the relationship between interest income and non-interest income and I find a positive correlation implying reduced diversification benefit. This finding adds to the literature by providing another evidence that non-interest income do not yield its intended diversification benefits, leading to increased systematic risk. Finally, this study contributes to the bank income-smoothing literature. Prior studies focus extensively on income smoothing through loan loss provisions (LLP). The findings of this study indicate that CF, not just LLP, can also be used by European banks to smooth reported earnings.

The remainder of the paper is organised as follows. Section 2 presents the conceptual framework for managerial discretion over CF. Section 3 discusses the relevant literature and develops the hypotheses. Section 4 presents the data and methodology. Section 5 reports the findings. Section 6 provides the conclusion.

2. Conceptual framework

2.1 Managerial discretion over CF

DeYoung and Rice (2004) argue that the low interest rate environment in Europe led to a significant reduction in bank's interest income and encouraged banks to rely more on non-interest source of fund to remain profitable. Despite the argument for banks' reliance on non-interest income, non-interest income in recent times is known to be very unstable compared to interest income and I argue that managers can exploit the unstable nature of banks' non-interest income as an opportunity to exert control on the level of non-interest income reported in their financial statement in each period. Stubben (2010) shows that firms can manipulate their revenue to manage earnings but his analysis did not examine banks.

Focussing on the CF component of banks' non-interest income, I argue that bank managers have some incentive to influence the reporting of CF in order to report persistent

high earnings or to report smooth earnings. Managerial discretion in the timing and recognition of CF implies that bank managers can exercise control over reported CF by deferring the receipt of CF to a future period to avoid reporting excessive profit in the current period if managers believe that reporting excess profit can attract unintended scrutiny by regulators. Also, bank managers can accelerate the receipt of future CF to the current period by using discount incentive to persuade clients to make early payments so that the CF received can be used to increase low earnings in the current period. Bank managers can also accelerate the receipt of future CF to the current period if they face pressure to report competitive earnings in each period compared to rival banks and this can be achieved by reporting higher CF to persistently increase reported earnings in each period.

2.2 CF: substitute or complement for earnings management

CF can act as a substitute to LLP for banks' earnings management purposes because CF is cheap to manage than managing accruals, it is much cheaper than other real earnings management (REM) activities, and it can disguise as normal operations of the bank making it difficult for bank supervisors to detect.

Also, because accounting rules and scrutiny of bank accruals by auditors can significantly limit the ability of managers to use accruals to manage reported earnings[1], therefore banks can rely on CF as a substitute to manage reported earnings when strict disclosure regulation makes it difficult for banks to use LLP estimate to manipulate the level of reported earnings, in this sense, CF can act as a substitute to LLP as an income-smoothing or income-increasing tool.

Although the practice of deferring and accelerating the receipt of banks' CF involves costs in the form of discounts and other incentive to clients to make them accelerate or delay fee income payments, and such discounts and incentive to clients are not as subject to *ex post* scrutiny by auditors or regulators compared to accruals because there is a real transaction involved. In addition, unlike other banks REM tools such as sale of securitised loans, European banks can mitigate any real effects arising from using CF to manage earnings by using guarantees and discount incentive to clients to persuade them to accelerate or defer CF to mitigate any anticipated shortfalls in earnings. Thus, European banks can easily realise CF without affecting its operations or risk profile, which makes CF a less costly substitute to other real and accrual transactions as earnings management tool.

2.3 Post-crisis environment and TBTF banks

Kleimeier (2002) and Evans *et al.* (2008) demonstrate that banking in Europe has become more competitive and more integrated in the last decade just before the 2008 financial crisis. In contrast to the pre-crisis banking environment, the post-crisis banking environment in Europe has become intensely regulated after the 2008 crisis (Temming, 2014), and bank LLP have been under close scrutiny by bank supervisors in the post-crisis period due to its inclusion in the determination of minimum regulatory capital ratios, making it less attractive for European banks to use LLP to manipulate reported earnings in the post-crisis period[2]. Moreover, during crisis periods, firm managers understand that accruals reverse over time (Allen *et al.*, 2013; DeFond and Park, 2001), therefore, bank managers are less likely to use accruals to smooth income or to increase income during recessions or crisis periods to avoid the subsequent accrual-reversing consequence. Moreover, bank managers can use CF to manage reported earnings during stressed times because it is easier to persuade clients to make repayments by issuing discounts to clients when they face difficulty to make repayments during stressed times, and banks can use received payments to augment shortfalls in earnings.

In the post-crisis period, the CF of European banks has become larger and more volatile due to narrow net interest margin arising from excessive competition and the volatile nature of CF in the post-crisis banking environment makes it an attractive tool for bank managers to use to manage reported earnings in the post-crisis period depending on their opportunity. Moreover, some banks are better positioned to realise higher CF compared to other banks. TBTF banks, for instance, have a larger client base due to economies-of-scope advantages and tend to have a more diverse source of CF including fee income from investment and trading activities, and managers of TBTF banks can use income generated from non-interest sources to manage reported earnings in the post-crisis period depending on their opportunity. Taken together, European banks will have less incentive to use LLP to smooth income or to increase income in the post-crisis environment due to increased scrutiny but can have greater incentive to use CF to smooth or to increase reported earnings particularly in the post-crisis period.

3. Related literature and hypothesis development

3.1 Literature review

3.1.1 Earnings management strategies. Generally, the literature shows that firm managers can manipulate reported earnings by using accrual-based earnings management (AEM), real activity-based earnings management, fraudulent accounting earnings management or a combination of all three (Guidry *et al.*, 1999; Kasznik, 1999; Gunny, 2005; Roychowdhury, 2006; Zang, 2011). AEM involves manipulating or influencing the size and timing of accruals to achieve some desired level of reported earnings (Gunny, 2005; Zang, 2011), and accruals are defined as the difference between operating profit and operating cash flow while discretionary accruals are accruals that cannot be explained by change in sales and the level of fixed assets (Hall *et al.*, 2013). However, the components of accruals that get manipulated vary by firm context and in predictable ways for firms in some industries (Marquardt and Wiedman, 2004). REM, on the other hand, occurs when managers take actions that disguise as normal operational activities in order to manipulate the level of reported earnings (Roychowdhury, 2006; Cohen *et al.*, 2008; Cohen and Zarowin, 2010), and is often accomplished by changing the firm's underlying operations (Gunny, 2005). Fraudulent accounting involves accounting choice that violate generally accepted accounting principles (GAAP) and is often accomplished by changing the choice of accounting methods used to represent the underlying activities of firms (Gunny, 2005). In contrast to fraudulent accounting, AEM and REM strategies involves the use of accounting choice to manipulate reported earnings within the limits allowed by generally acceptable accounting practices. Moreover, firms may use a combination of accrual- or real activities-based earnings management strategies to manage reported earnings to: avoid reporting a loss (Hayn, 1995; Burgstahler and Dichev, 1997; Degeorge *et al.*, 1999); engage in income-increasing earnings management (Rangan, 1998; Barth *et al.*, 1999); or to smooth reported earnings over time (see Kirschenheiter and Melumad, 2002; Bhattacharya *et al.*, 2003; Lapointe-Antunes *et al.*, 2006; Ozili, 2015). Table I summarises the earnings management strategies.

Also, several earnings management studies focus on the use of single accounting numbers to manage reported earnings in contexts where earnings management is likely to occur in non-financial firms (e.g. Jones, 1991; Dechow and Sloan, 1991); while other studies examine the use of multiple accounting numbers (Cohen *et al.*, 2008; Cohen and Zarowin, 2010; Badertscher, 2011). Among the vast portfolio of earnings management strategies available to managers, the common accounting choice or financial numbers used to manage reported earnings include: changes to pension assumptions, inventory methods, depreciation method and estimates (Sweeney, 1994); pension costs (Thomas and Tung, 1992; Bergstresser and Philippon, 2006); reduction in advertising, and research and development expense (Baber *et al.*, 1991;

EM strategy	Accrual EM	Real EM	Fraudulent EM
Technique	Manipulate the size and timing of accruals to achieve some desired level of reported earnings	Change the firm's underlying operations to disguise as normal operational activities in order to manipulate the level of reported earnings	Change the choice of accounting methods used to represent the underlying activities of firms in ways that violate GAAP
Within GAAP limit?	Yes	Yes	No
Supporting evidence	Ahmed *et al.* (1999), Marquardt and Wiedman (2004), Gunny (2005), Zang (2011) and Hall *et al.* (2013)	Bartov (1993), Burgstahler and Dichev (1997), Graham *et al.* (2005), Roychowdhury (2006), Cohen *et al.* (2008) and Cohen and Zarowin (2010)	Gunny (2005)

Note: GAAP, generally accepted accounting principles

Table I. Summary of earnings management strategies

Dechow and Sloan, 1991; Perry and Grinaker, 1994; Bushee, 1998; Graham *et al.*, 2005; Gunny, 2005; Cohen and Zarowin, 2010); sales discounts (Graham *et al.*, 2005; Roychowdhury, 2006); inventory overproduction (Thomas and Zhang, 2002; Gunny, 2005; Roychowdhury, 2006); stock repurchase (Hribar *et al.*, 2006); derivative hedging (Barton, 2001; Pincus and Rajgopal, 2002); and securitisation (Dechow and Shakespear, 2009; Dechow *et al.*, 2010; Van Beest, 2009).

In the financial services sector, the literature shows that banks either use several financial numbers to manage reported earnings depending on their opportunity and the cost associated with using such financial numbers, and these financial numbers include available-for-sale securities (Barth *et al.*, 2016), loan charge-offs (Beatty *et al.*, 1995), LLP (Ahmed *et al.*, 1999; Ozili, 2017a, b); gains from the timing of asset sales (Bartov, 1993; Herrmann *et al.*, 2003); and realised and unrealised gains and losses on the sale of securities (Beatty *et al.*, 1995, 2002). These earnings management strategies are summarised in Table II.

3.1.2 Non-interest income: theoretical literature. Non-interest income is the revenue that financial institutions generate from activities that are not related to lending and

S/N	Accounting numbers	Supporting evidence
1	Changes to pension assumptions, inventory methods, depreciation method and estimates	Sweeney (1994)
2	Available-for-sale securities	Barth *et al.* (2016)
3	Loan charge-offs	Beatty *et al.* (1995)
4	Provision for loan loss or loan loss provisions	Ahmed *et al.* (1999) and Ozili (2017a, b)
5	Gains from the timing of asset sales	Bartov (1993) and Herrmann *et al.* (2003)
6	Pension costs	Thomas and Tung (1992) and Bergstresser and Philippon (2006)
7	Reduction in advertising and R&D expense	Baber *et al.* (1991), Dechow and Sloan (1991), Perry and Grinaker (1994), Bushee (1998), Graham *et al.* (2005), Gunny (2005) and Cohen and Zarowin (2010)
8	Use of sales discounts	Graham *et al.* (2005) and Roychowdhury (2006)
9	Inventory overproduction	Thomas and Zhang (2002), Gunny (2005) and Roychowdhury (2006)
10	Stock repurchase	Hribar *et al.* (2006)
11	Derivative hedging	Barton (2001) and Pincus and Rajgopal (2002)
12	Securitisation	Dechow and Shakespear (2009), Dechow *et al.* (2010) and Van Beest (2009)

Table II. Financial numbers used to manage reported earnings

depository activities. Early studies argue that non-interest income is more stable than interest income and should be negatively correlated with interest income if any revenue diversification benefit is to be gained (Saunders and Walters, 1994; Gallo *et al.*, 1996). This view dominated the literature a decade ago due to the diversification benefits associated with engaging in non-depository and non-interest-generating activities. On the other hand, DeYoung and Roland (2001) argue that non-interest income is rather less stable than interest income because clients can easily change banks to receive non-interest services from other banks while depositors and lenders do not change banks very easily; hence, non-interest income is subject to higher fluctuation than interest income.

Also, there is the argument about whether banks engage in non-interest activities mainly to off-set margin shortfall or to diversify their income stream. DeYoung and Rice (2004) argue that banks engage in non-interest activities to generate additional non-interest income to boost shortfall in overall profitability implying that the increase in non-interest income (e.g. increase in CF) is in response to declining overall earnings and is not necessarily a substitute for interest income. On the other hand, DeLong (2001), Stiroh (2004) and Stiroh and Rumble (2006) argue that banks engage in non-interest activities to diversify their income stream, justifying banks' reliance on non-interest income. The recent change in the behaviour of banks' non-interest income which today forms a large part of bank revenue makes it a useful target for bank earnings management.

3.1.3 CF: evidence. The empirical literature documents mixed evidence to support the view that an increase in bank fee-generating non-depository activities yields its intended diversification benefits. Rather studies show that banks' involvement in non-interest activities can increase bank (systematic) risk rather than reducing bank risk, and the increase in systematic risk arises from the positive correlation between interest income and non-interest income (e.g. CF) (see Stiroh, 2004; Stiroh and Rumble, 2006; Baele *et al.*, 2007; Lepetit *et al.*, 2008a, b; Schmid and Walter, 2009). For instance, Stiroh (2004) observes a positive correlation between fee income and bank interest margin for US banks, and the correlation increases over time implying decreasing diversification benefit and higher systematic risk. Lee *et al.* (2014) examine the impact of non-interest income on bank profitability and risk for 967 individual banks across 22 Asian countries over the 1995-2009 period and find that the non-interest activities of Asian banks reduce systematic risk but do not increase profitability. They observe that engaging in non-interest activities increases the risk of banks in high-income countries while increasing the profitability or reducing risk for banks in middle and low-income countries. They conclude that bank's specialisation and country's income-level matters for bank's income diversification. Williams (2016) investigates the relationship between bank's revenue composition and bank's risk in Australia and finds that banks with lower non-interest income and higher revenue concentration are less risky, and non-interest income increases banks' risk but some types of non-interest income are risk-reducing when bank's specialisation effects are considered. Williams (2016) also observes that the 2008 financial crisis had some impact on the relationship between bank's risk and revenue composition. Köhler (2014) examines the impact of non-interest income on bank's risk in the German banking sector over the 2002 and 2010 period and finds that smaller banks and retail-oriented banks have greater benefits from income diversification compared to larger and investment-oriented banks. Köhler (2014) concludes that the impact of non-interest income on risk depends on the business model of a bank. Sanya and Wolfe (2011) examined the effect of revenue diversification on bank performance and risk among 226 banks across 11 emerging economies and found that revenue diversification enhances profitability but decreases insolvency risk particularly for banks that have moderate risk exposures. Pennathur *et al.* (2012) examined the impact of ownership on income diversification and risk for Indian

banks over the 2001-2009 period and found that public sector banks have lower fee income while foreign banks report higher fee income. They also found that public sector banks with higher levels of state ownership are less likely to pursue non-interest income sources. Ahamed (2017) investigates the impact of ownership and asset quality on bank non-interest income among banks in India and finds that higher share of non-interest income yields higher profits and risk-adjusted profits particularly when banks are involved in more trading activities and for banks that have lower asset quality. Meslier *et al.* (2014) examined the impact of bank revenue diversification on the performance of banks in an emerging economy and find that banks' shift towards non-interest activities increases bank profits and risk-adjusted profits particularly when they are involved in trading in government securities. They also found that foreign banks benefit more from revenue diversification compared to domestic banks while revenue diversification is more beneficial for banks with low exposure to SMEs. Taken together, these studies show that CF can either increase bank systematic risk or yield some diversification benefits.

Some studies examine the link between systemic risk and CF. DeYoung and Torna (2013) examined whether income from non-traditional banking activities contributed to the failure of hundreds of US commercial banks during the financial crisis and found that the probability of distressed bank failure declined among banks that rely solely on fee-based non-traditional activities such as securities brokerage and insurance sales while the risk of bank failure increased among banks that rely on asset-based non-traditional activities such as venture capital, investment banking and asset securitisation during the financial crisis. Also, Brunnermeier *et al.* (2012) showed that banks with higher non-interest income (non-core activities like investment banking, venture capital and trading activities) have a higher contribution to systemic risk than traditional banking (deposit taking and lending). They decompose total non-interest income into two components, trading income and investment banking and venture capital income, and found that both components are equally related to systemic risk. The implication of their study is that a significant decline in CF for all banks can have systemic consequences on the profit margin of the banking sector.

3.1.4 Managing earnings through CF. Overall, the literature focusses extensively on non-interest income as an income-increasing item or an item used by banks to increase or decrease systematic risk but pay less attention to whether bank managers have incentive to use one or more non-interest income items to smooth reported earnings as a bank stability strategy when banks are in volatile business environments or to smooth income so that reported earnings are never too high or too low to attract regulatory scrutiny. Prior studies did not examine the relationship between CF and bank EBCF. In contrast, I focus on CF (a major component of bank non-interest income) and EBCF[3]. I examine the relationship between CF and EBCF to detect whether CF is used by banks to smooth reported earnings or to increase reported earnings, an issue that has not been explored in the banking literature to date.

3.2 Hypothesis

Bank managers have discretion in the timing and recognition of bank CF in bank financial reports and such discretion can be used to meet several financial reporting objectives. To develop the hypotheses, I argue that bank managers can use their discretion in reporting fee income to either stabilise/smooth bank earnings over time for bank stability reasons or to persistently increase bank profit for opportunistic reasons. To smooth income, I expect bank managers to report fewer CF in the current period when they expect high earnings to avoid reporting excessive profit that could attract regulatory/political scrutiny of excessive bank profit. This leads to the first hypothesis:

H1. A negative (and significant) association between CF and EBCF is expected, representing income smoothing.

To persistently increase income, I expect bank managers to report higher CF in the current period to increase profit, as an income-increasing earnings management strategy. This leads to the second hypothesis:

H2. A positive (and significant) association between CF and EBCF is expected, representing income-increasing earnings management.

4. Data and methodology

4.1 Data

I use a sample of 231 European bank holding companies from 2004 to 2014. Financial statement information for each bank is obtained from Bankscope database. Some observations are missing for some years; hence, the data distribution is an unbalanced panel. GDP growth rate data are obtained from the World Economic Forum. Detailed sources for each specific variable used in the estimation employed in this study are given in Table AIII.

4.2 Methodology

To test whether European banks use CF to manage reported earnings, I use a variation of the models used by prior studies (e.g. Ahmed *et al.*, 1999; Stubben, 2010; Barth *et al.*, 2016) that examine the statistical relationship between an accounting number and earnings before the accounting number while controlling for other factors that might influence the magnitude of the reported accounting number. I estimate the association between CF and EBCF to detect whether European banks use CF to smooth income or to increase income.

The model is specified as follows:

$$\begin{aligned} \mathrm{CF}_{i,J,t} = {} & \mathrm{CF}_{i,J,t-1} + \mathrm{LLP}_{i,J,t} + \mathrm{EBCF}_{i,J,t} + \mathrm{NII}_{i,J,t} + \Delta\mathrm{GDP}_{J} \\ & + \mathrm{SIZE}_{i,J,t} + \mathrm{CRISIS}_{J,t} + \mathrm{CRISIS}_{t} \times \mathrm{EBCF}_{i,J,t} + e_{i,J,t} \end{aligned} \tag{1}$$

where i = bank; t = year; J = country; CF = ratio of net commission and fee income to total assets; CF_{t-1} = lagged or beginning net commission and fee income to total asset ratio; LLP = ratio of loan loss provisions to total asset; NII = ratio of net interest income (defined as interest income minus interest expense) to total assets; SIZE = natural logarithm of bank total assets; ΔGDP = real gross domestic product growth rate, a proxy for the state of the economy; EBCF = the ratio of earnings before tax and commission and fee income to total asset; CRISIS = a dummy variable that takes the value "1" for the post-financial crisis 2008 period and "0" for pre-financial crisis 2008 period; CRISIS × EBCF = interaction variable that measures the extent that banks use commission and fee income to manage bank earnings in the post-crisis period relative to the pre-crisis period; POS = a dummy variable that takes the value "1" if EBCF is positive and "0" if EBCF is negative; POS × EBCF = capture periods when banks have a positive EBCF.

The dependent variable "CF" is the ratio of net CF to total asset where net CF is the arithmetic difference between CF minus commission expense. The lagged dependent variable "CF_{t-1}" accounts for the dynamic behaviour of CF. Banks that have high CF in the previous period are likely to expect higher CF in the current period due to increasing client base and client loyalty to the bank.

The earnings variable of interest "EBCF" is the ratio of earnings before tax and net CF to total asset. As discussed previously, a positive sign on EBCF coefficient indicates that banks use CF to engage in income-increasing earnings management while a negative sign on EBCF indicates that banks use CF to engage in income smoothing.

I incorporate several control variables. Consistent with prior studies (Ho and Saunders, 1981; Angbazo, 1997; Wong, 1997; Saunders and Schumacher, 2000), I incorporate the NII variable to test whether bank interest income is significantly

associated with bank non-interest income (CF). A negative association between NII and CF would imply greater income diversification benefit which reduces systematic risk while a positive association implies reduced income diversification benefit and increase in systematic risk. I calculate the net interest margin as the difference between interest income minus interest expense divided by total assets (Ho and Saunders, 1981; Angbazo, 1997; Saunders and Schumacher, 2000). With regard to bank size (SIZE), larger banks have a more diverse client base. The larger the client base, the larger the expected CF from clients, implying a positive association between CF and SIZE. With respect to LLP, Hasan and Hunter (1999) suggest that banks that have substantial interest in non-depository activities will keep higher LLP to cover for losses arising from engaging in those non-depository activities. Therefore, banks that actively engage in non-depository activities that generate substantial fee and commission income will keep more provisions to cover for unrealised fee and commission income from such activities, hence, a positive association between LLP and CF is expected. Furthermore, banking crises can have a negative effect on banks' non-interest income (or CF). During banking crises, banks' clients easily lose confidence in banks and are less likely to remain loyal to any bank during such periods. Banks' clients can immediately withdraw its commitment and loyalty to any bank depending on the severity of the crisis and the impact of the crisis on bank clients. Therefore, I introduce the CRISIS variable to control for the impact of the global financial crisis on banks' CF. CRISIS is a dummy variable that is equal to 1 for the post-financial crisis period (2009-2014) and 0 for pre-financial crisis (2004-2006) period. At the country level, the real gross domestic product growth rate (ΔGDP) control for changes in economic conditions. During bad economic times, banks' clients will face a hard time and may not be able to pay the expected fee and commission for banking services offered to them. Also, bad economic times are followed by a general decrease in business activities which further reduces the opportunities for banks to generate more fee income from clients during bad times. During good economic times, on the other hand, banks' clients will be able to pay the relevant fee and commission for services offered to them. Also, banks will have higher level of business activities that generate higher fee income during good economic times, thus, increasing their opportunities to generate more fee income from clients during good times.

To estimate the model, I employ the Arellano and Bond's (1991) generalised-method-of-moments (GMM) estimator developed for dynamic panel models. The GMM estimation technique allows us to address three econometric issues: the presence of unobserved bank-specific effects which is eliminated by taking first-differences of all variables; the autoregressive process in the data regarding the behaviour of CF (i.e. the need to use a lagged dependent variable to capture the dynamic nature of CF); and the likely endogeneity of the explanatory variables. The descriptive statistics for the variables are reported in Table AI and the correlation coefficients are reported in Table AII.

5. Results

5.1 Empirical findings

The statistical significance of EBCF coefficient confirms whether or not European banks use CF to increase reported earnings or to smooth reported earnings. A negative sign for EBCF coefficient indicates that banks report higher CF when EBCF is low and vice versa, representing income smoothing while a positive sign for EBCF coefficient indicates that banks reported higher CF when EBCF is high and vice versa, representing income-increasing earnings management.

Table III reports the following results. EBCF coefficient is negatively significant in Columns (1)[a] and (1)[b] implying that European banks use CF to smooth reported earnings. The observed income smoothing by European banks is possibly aimed at the need to avoid reporting too high earnings that could attract scrutiny of bank profits by regulators.

Variables	Coefficient (*t*-statistic) Earnings management (1)[a]	(1)[b]	Pre- and post-financial crisis (2)[a]	(2)[b]
EBCF	−0.087*** (−4.42)	−0.094*** (−4.75)	−0.350*** (−7.90)	−0.368*** (−9.21)
CRISIS × EBCF			0.285 (13.09)***	0.293 (14.83)***
CF_{t-1}	0.569*** (21.56)	0.569*** (20.81)	0.296*** (11.69)	0.290*** (11.75)
LLP	−0.114*** (−4.50)	−0.123*** (−5.00)	−0.058** (−2.45)	−0.067*** (−2.74)
SIZE	0.002 (0.71)	0.001 (0.44)	0.0002 (0.11)	0.0001 (0.07)
NII	0.101*** (2.73)	0.134*** (3.64)	0.059* (1.89)	0.077** (2.32)
ΔGDP	0.0003*** (3.72)	0.0003*** (3.33)	0.0004*** (−3.76)	0.0004*** (3.68)
CRISIS			−0.001 (−0.24)	−0.0003 (−0.64)
J-statistic	60.93	60.77	41.46	38.11
P(*J*-statistic)	0.014	0.014	0.28	0.42
Observations	1,874	1,874	1,874	1,874

Notes: First-differenced bank fixed effect and period fixed effect are included in all estimations. White period robust standard error correction is applied. All bank-level variables remain as previously defined. CF is net commission and fee income to total asset. CF_{t-1} is lagged or beginning commission and fee income to total asset. LLP is loan loss provisions to total asset. SIZE is natural logarithm of bank total asset. ΔGDP is real gross domestic product growth rate. EBCF is earnings before tax and commission and fee income to total asset. CRISIS is a dummy that take the value of one for the post-crisis period and zero for pre-crisis 2008 period. CRISIS × EBCF measures the extent that banks use commission and fee income to manage earnings in the post-crisis period relative to the pre-crisis period. [a]GMM based on Arellano-Bond (1991); [b]GMM based on Arellano-Bover (1995). *t*-statistics are reported in parentheses with *,**,***significant at 10, 5 and 1 per cent levels, respectively

Table III.
Full sample regression result

For the control variables, NII coefficient is positively significant indicating that a decrease (increase) in interest income is followed by lower (higher) CF (or non-interest income) implying a higher systematic risk due to reduced income diversification benefit to European banks and this result supports the findings of Stiroh (2004) who found a positive correlation between fee income and bank interest income for US banks. ΔGDP coefficient is positively significant implying that European banks realise higher CF during good economic times and realise fewer CF during economic recessions implying that bank CF is procyclical with the fluctuating economic conditions. SIZE coefficient is insignificant. Contrary to expectation, LLP coefficient is negatively significant implying that European banks that engage in greater non-depository activities keep fewer LLP. One explanation for this result could be that LLP are rather sensitive to income from interest-generating activities rather than income from non-interest activities.

Next, I test the relationship between CF and EBCF in the post-crisis period relative to the pre-crisis period. The CRISIS dummy variable is introduced into the model and is interacted with the EBCF variable and the result is reported in Columns (2)[a] and (2)[b] in Table III. CRISIS × EBCF coefficient is positively significant and implies that European banks use CF to engage in income-increasing earnings management to a greater extent in the post-crisis period relative to the pre-crisis period. Intuitively, this result can be explained by the fact that European banks rely more on non-interest income to increase overall earnings in the post-crisis period because post-crisis banking regulation discouraged European banks from using depositors' money to engage in risky lending, thus reducing banks' interest income margin. European banks that are affected by the declining interest income margin in the post-crisis period will rely more on non-interest income to manage reported earnings by engaging in income-increasing earnings management.

5.2 Subsample analysis: TBTF banks vs NTBTF banks?

Next, I examine the relationship between CF and EBCF for TBTF banks and NTBTF banks in the European bank sample to detect whether there is a significant change in this

relationship when banks have substantial earnings (i.e. when they have positive (non-negative) earnings). To capture substantial earnings, I introduce the POS dummy variable that is equal to 1 when EBCF is positive and equal to 0 when EBCF is negative, representing periods when TBTF and NTBTF banks are profitable and the POS variable is then interacted with the EBCF variable to detect whether European TBTF and NTBTF banks use CF to manage earnings when they have substantial earnings. The main model is adjusted below and the result is reported in Table IV:

$$\mathrm{CF}_{i,J,t} = \mathrm{CF}_{i,J,t-1} + \mathrm{LLP}_{i,J,t} + \mathrm{EBCF}_{i,J,t} + \mathrm{NII}_{i,J,t} + \Delta\mathrm{GDP}_{J,t} + \mathrm{SIZE}_{i,J,t} + \mathrm{POS}_{i,J,t} + \mathrm{POS}_{i,J,t} \times \mathrm{EBCF}_{i,J,t} + e_{i,J,t} \quad (2)$$

For European TBTF banks, EBCF coefficient is insignificant in Columns (1)[a] and (1)[b] of Table IV. Further, I check whether the relationship between CF and EBCF for TBTF banks is significantly influenced by the size of earnings. POS × EBTP coefficient is insignificant to make any meaningful inference in Columns (2)[a] and (2)[b] of Table IV. ΔGDP coefficient is negatively significant for TBTF banks in all estimations in Columns 1 and 2 implying that the CF of TBTF banks is not procyclical with fluctuating economic conditions, and indicates that European TBTF banks report fewer CF during good economic times and higher CF during bad economic times. NII coefficients are all positively significant for TBTF banks in Columns 1 and 2 implying increase in bank risk due to reduced income diversification benefit.

For European NTBTF banks, EBCF coefficient is negatively significant in Columns (3)[a] and (3)[b] in Table IV implying that NTBTF European banks use CF to smooth reported earnings. Similarly, I check whether the relationship between CF and EBCF for NTBTF banks is significantly influenced by the size of earnings. POS × EBTP coefficient is insignificant to make any meaningful inference in Columns (4)[a] and (4)[b] implying that the relationship between CF and EBCF is not significantly influenced by the size of earnings. ΔGDP coefficient is positively significant for NTBTF banks in all estimations in Columns 3 and 4 implying that the CF of NTBTF banks is procyclical with fluctuating economic conditions and indicates that European NTBTF banks report higher CF during good economic times and report fewer CF during bad economic times. NII coefficient is also positively significant for NTBTF banks in Columns (3)[a], (3)[b] and (4)[b] implying increase in bank risk due to reduced income diversification benefit.

5.3 Further test and robustness checks

Further, I test whether the use of CF to manage reported earnings depends on the level/size of non-interest income in the previous period. Put differently, I test whether the use of CF to manage reported earnings is influenced by *ex post* interest income levels. To do this, I interact the EBCF coefficient with the lagged NII variable and I re-specify the model below and the variable of interest here is the $\mathrm{NII}_{t-1} \times \mathrm{EBCF}$ coefficient reported in Table V:

$$\mathrm{CF}_{i,J,t} = \mathrm{CF}_{i,J,t-1} + \mathrm{LLP}_{i,J,t} + \mathrm{EBCF}_{i,J,t} + \mathrm{SIZE}_{i,J,t} + \mathrm{NII}_{i,J,t} + \Delta\mathrm{GDP}_{j,t} + \mathrm{NII}_{i,J,t-1} \times \mathrm{EBCF}_{i,J,t} + e_{i,J,t} \quad (3)$$

$\mathrm{NII}_{t-1} \times \mathrm{EBCF}$ coefficient is positively significant in Column 1 of Table V implying that the use of CF to engage in income-increasing earnings management is significantly influenced by *ex post* (or lagged) interest income levels, implying that European banks that have high interest income margin in the previous period are more likely to use CF to increase earnings in the current period. Also, I check whether the extent of earnings smoothing or income-increasing earnings management is significantly associated with the size of the bank.

Table IV.
Too-big-to-fail and non-too-big-to-fail banks

	Coefficient (*t*-statistic)							
	Too-big-to-fail banks				Non-too-big-to-fail banks			
Variables	(1)[a]	(1)[b]	(2)[a]	(2)[b]	(3)[a]	(3)[b]	(4)[a]	(4)[b]
EBCF	−0.023 (−1.62)	−0.023 (−1.12)	−0.061** (−2.11)	−0.056** (−2.56)	−0.076*** (−5.84)	−0.084*** (−6.44)	−0.028 (−1.46)	−0.047** (−2.37)
POS × EBCF			0.051 (0.42)	0.032 (0.48)			−0.016 (−0.27)	0.033 (0.54)
$CF_{i,\ t-1}$	0.281*** (10.09)	0.301*** (8.39)	0.246*** (3.52)	0.301*** (6.27)	0.493*** (25.76)	0.496*** (22.23)	0.501*** (24.72)	0.530*** (20.75)
LLP	0.109*** (5.69)	0.086*** (4.31)	0.128*** (3.26)	0.088*** (3.39)	−0.076*** (−5.12)	−0.087*** (−6.08)	−0.007*** (−2.71)	−0.083*** (−2.89)
SIZE	−0.003*** (−2.82)	−0.003*** (−2.69)	−0.003* (−1.69)	−0.003*** (−2.83)	0.007*** (−3.57)	−0.007*** (−3.44)	−0.007*** (−2.71)	−0.004* (−1.72)
NII	0.119*** (3.48)	0.157*** (6.14)	0.141*** (2.88)	0.149*** (3.89)	0.028* (1.70)	0.059*** (3.67)	−0.005 (−0.19)	0.050* (1.93)
ΔGDP	−0.0004*** (−5.00)	−0.0003*** (−3.03)	−0.0004*** (−3.35)	−0.0003*** (−2.82)	0.0002*** (3.51)	0.0003*** (3.51)	0.0002* (1.93)	0.0002** (2.04)
POS			0.001 (1.46)	0.001** (2.07)			−0.002*** (−4.02)	−0.0002*** (−4.16)
J-statistic	23.51	22.26	20.24	22.76	52.60	51.80	43.20	45.78
P(*J*-statistic)	0.55	0.62	0.63	0.47	0.07	0.08	0.22	0.15
Observations	329	329	329	329	1,533	1,533	1,533	1,533

Notes: First-differenced bank fixed effect and period fixed effect is included in all estimations. White period robust standard error correction is applied. All bank-level variables remain as previously defined. POS is a dummy variable that equal 1 if EBCF is positive and 0 if EBCF is negative, representing periods when banks have positive (non-negative) earnings. POS × EBCF measures whether banks use commission and fee income to manage earnings when they are more profitable, that is, when they have positive or non-negative earnings. [a]GMM based on Arellano-Bond (1991); [b]GMM based on Arellano-Bover (1995). *t*-statistics are reported in parentheses with *,**,***significant at 10, 5, and 1 per cent levels, respectively

Table V.
Further test and robustness checks

	Coefficient (*t*-statistic)					
	Further tests		Robustness checks			
			Full sample		TBTF banks	NTBTF banks
Variables	(1)	(2)	(3)	(4)	(5)	(6)
	GMM	GMM	OLS	OLS	OLS	OLS
c			0.007* (1.85)	0.020*** (2.90)	0.017 (1.45)	0.021*** (2.68)
EBCF	−0.233*** (−8.29)	−0.983*** (−3.17)	−0.526*** (−3.14)	−0.055** (−2.41)	−0.104** (−2.19)	−0.055** (−2.31)
$NII_{t-1} \times EBCF$	5.867*** (7.32)					
SIZE × EBCF		0.119*** (2.98)				
CRISIS × EBCF			0.299** (2.03)			
CRISIS			−0.002*** (−4.85)			
$CF_{i,\ t-1}$	0.468*** (20.64)	0.452*** (22.26)				
LLP	−0.098*** (−3.68)	−0.086*** (−3.82)	−0.251*** (−4.23)	−0.047** (−2.08)	−0.044 (−0.76)	−0.049** (2.05)
SIZE	−0.002 (−1.11)	−0.003** (−1.99)	−0.0006 (−1.31)	−0.002** (−2.45)	−0.002 (−1.13)	−0.002** (−2.29)
NII	0.157*** (4.17)	−0.009 (−0.39)	0.376*** (10.78)	0.141*** (4.68)	0.148** (2.59)	0.139*** (4.18)
ΔGDP	0.0004*** (3.49)	0.0001 (1.41)	0.0001 (0.98)	0.0002*** (2.97)	−0.00001 (−0.25)	0.0002*** (2.97)
Bank and period fixed effects			No	Yes	Yes	Yes
J-statistic	51.17	52.75				
P(*J*-statistic)	0.08	0.06				
Adjusted R^2			42.04	90.23	90.12	90.21
F-statistic			242.26	88.78	69.91	87.21
Observation				2,329		

Notes: Regressions 1 and 2 are estimated using Arellano and Bond's (1991) GMM estimator while regressions 3-6 are estimated using ordinary least-square (OLS). Bank and period fixed effects are included in Columns 4-6 except Column 3. White period robust standard error correction is applied to all regression. *t*-statistics are reported in parentheses with *,**,***significant at 10, 5 and 1 per cent levels, respectively

I interact EBCF with SIZE and find that the SIZE × EBCF coefficient is positively significant in Column 2 of Table V implying that larger European banks are more likely to use CF to engage in income-increasing earnings management in the current period.

In the robustness checks employed in this study, I verify whether the significance of the main results is driven by the presence of lagged dependent variable and whether the main results will change significantly after excluding the lagged dependent variable. I re-run the full sample and the sub-samples without including the lagged dependent variable. Eliminating the lagged dependent variable "CF_{t-1}" implies that fixed effect OLS regression is the appropriate estimation technique to estimate the model and the results are reported in Columns 3-6 of Table V. As can be observed, EBCF coefficient remain negatively significant and is robust to the earlier GMM estimation results that show evidence that European banks use CF to smooth reported earnings. Finally, to address any concern about multicollinearity between NII and EBCF, the correlation matrix reported in Table AI shows that the correlation between NII and EBCF is sufficiently low at 0.5 per cent implying that multicollinearity is not an issue in the analyses.

6. Conclusion

This study examines whether European banks use CF for earnings management purposes. I focus on two types of earnings management strategy: income-smoothing or income-increasing earnings management by examining the statistical relationship between CF and EBCF. I find that European banks use CF to smooth earnings so that earnings are never too high or too low and this behaviour is more pronounced among NTBTF European banks compared to TBTF European banks. I also find that the CF of NTBTF banks is procyclical with fluctuating economic conditions but not for TBTF banks. Also, I find evidence for income-increasing earnings management during the post-crisis period for larger European banks and when *ex post* interest income levels are taken into account. Therefore, I conclude that the propensity for European banks to use CF to engage in income-increasing earnings management significantly depends on bank size and *ex post* interest margin considerations.

Finally, bank regulators and policy researchers in Europe should be aware that the income generated from non-interest activities are rather used to manipulate reported earnings as an income-increasing or income-smoothing strategy. With regard to the income diversification debate, the findings of this study contribute to the diversification debate and support the argument that non-interest income yields lower diversification benefits to European banks and increase bank (systematic) risk. Therefore, bank regulators in Europe should be aware that European banks' reliance on non-interest income increases bank risk rather than reducing risk.

Notes

1. Leventis *et al.* (2011) found that the extent to which European banks use accruals to manage earnings is reduced after mandatory IFRS adoption. Balla and Rose (2015) examined whether accounting constraints introduced by the US SEC in 1998 limit the ability of US banks to use accruals to manage reported earnings, they find evidence for reduced earnings management. Ozili (2017a) found that bank accruals are used to manage credit risk and to smooth income in European banks.
2. Caporale *et al.* (2015) examined 400 Italian banks during the 2001-2012 period and show that banks do not use discretionary accruals to smooth income during the 2008-2012 recession.
3. I focus on commission and fee income because of its importance for the diversification of bank income stream.

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Appendix 1

	Mean	SD	Minimum	Maximum	Observations
All banks					
CF	0.005	0.006	−0.007	0.068	2,359
EBCF	−0.001	0.011	−0.155	0.082	2,359
NII	0.013	0.009	−0.004	0.098	2,371
SIZE	7.997	0.606	6.259	9.581	2,381
LLP	0.004	0.008	−0.051	0.134	2,349
TITF banks					
CF	0.006	0.004	−0.001	0.021	413
EBCF	−0.0001	0.006	−0.039	0.018	413
NII	0.012	0.009	−0.004	0.051	412
SIZE	8.536	0.706	7.212	9.581	414
LLP	0.003	0.004	−0.003	0.033	412
Non-TITF banks					
CF	0.005	0.006	−0.007	0.068	1,935
EBCF	−0.001	0.012	−0.155	0.082	1,935
NII	0.013	0.009	−0.003	0.099	1,948
SIZE	7.885	0.517	6.259	9.221	1,956
LLP	0.004	0.008	−0.051	0.134	1,926

Notes: SD, standard deviation. From the data, a look at the descriptive statistics in Table AI. CFs are on average 0.5 per cent of total assets. CFs are also marginally larger for too-big-to-fail (TBTF) European banks compared to non-too-big-to-fail (NTBTF) banks at 0.6 and 0.5 per cent, respectively, indicating that TBTF banks generate higher commission and fee income than NTBTF banks. Also, EBCF is lower for TBTF banks compared to NTBTF banks. The lower EBCF observed for too-big-to-fail European banks indicates that a larger portion of the earnings of TBTF banks are commission and fee income which eventually declines after fee income is deducted from total earnings. When commission and fee income is deducted from the earnings of TBTF banks, EBCF becomes negative implying that commission and fee income is a major component of earnings for TBTF banks. NII is, on average, 1.3 per cent while NTBTF banks have a slightly higher net interest revenue than TBTF banks implying that TBTF banks rely less on interest-generating activities compared to NTBTF banks. On average, SIZE is 7.99 while SIZE is 8.54 for TBTF banks and 7.88 for NTBTF banks implying that TBTF banks are generally larger than non-too-big-to-fail European banks. LLPs are on average 0.4 per cent for the full sample and is lower for TBTF banks at 0.3 per cent compared to NTBTF banks of 0.4 per cent

Table AI.
Descriptive statistics

Appendix 2

Variable	CF	LLP	ΔGDP	NII	SIZE	POS	CRISIS	EBCF
CF	1.000							
LLP	0.137***	1.000						
	0.000							
ΔGDP	−0.010	−0.247***	1.000					
	0.624	0.000						
NII	0.438***	0.381***	−0.073***	1.000				
	0.000	0.000	0.001					
SIZE	−0.143***	−0.029	−0.009	−0.185***	1.000			
	0.000	0.155	0.676	0.000				
POS	−0.390***	−0.2556***	0.238***	−0.049**	−0.078***	1.000		
	0.000	0.000	0.000	0.016	0.000			
CRISIS	−0.085***	0.187***	−0.505***	−0.043**	0.094***	−0.271***	1.000	
	0.000	0.000	0.000	0.037	0.000	0.000		
EBCF	−0.291***	−0.616***	0.235***	0.005	−0.038*	0.531***	−0.218***	1.000
	0.000	0.000	0.000	0.828	0.064	0.000	0.000	

Notes: Panel A presents the correlation matrix and the associated *p*-values. CF is net commission and fee income to total assets; LLP is loan loss provisions to total asset; SIZE is natural logarithm of bank total assets; ΔGDP is real gross domestic product growth rate; EBCF is the earnings variable; CRISIS is a dummy which take the value "1" for the post-crisis 2008 period and "0" for pre-crisis 2008 period; POS is a dummy which take the value "1" if EBCF is positive and "0" if EBCF is negative. Pearson correlation coefficients in Table AII show that CFs are negative and significantly correlated with bank earnings EBCF (0.291***) for European banks and supports the argument for income smoothing. CFs are negative and significantly correlated with SIZE (–0.143) indicating that larger banks may have lower commission and fee. CFs are positive and significantly correlated with NII (0.438***) and this positive correlation implies that there is reduced diversification benefits for European banks as interest income and non-interest income move in the same direction. *t*-statistics are reported in parentheses with *,**,***significant at 10, 5 and 1 per cent levels, respectively

Table AII.
Pearson correlation matrix

Appendix 3

Variable	Description	Source
CF	Net commission and fee income divided by total asset. Net commission and fee income is measured as commission revenue minus commission expense	Bankscope database
SIZE	Natural logarithm of total asset	Bankscope database
LLP	Loan loss provisions divided by total assets	Bankscope database
EBCF	Earnings before net commission and fee income (profit before tax minus net commission and fee income) divided by total asset	Bankscope database
NII	Net interest income measured as interest income minus interest expense	Bankscope database
ΔGDP	Real gross domestic product growth rate	World Economic Forum archived in World Bank database
TBTF	Refer to too-big-to fail (TBTF) banks. To identify the TBTF banks, I use the BCBS and FSB's 2014 list of global systemically important banks (G-SIBs). European banks included in this list are considered to be too-big-to-fail while European banks that are not included in this list are considered to be non-too-big-to-fail (NTBTF)	Obtained from: www.fsb.org/2014/11/2014-update-of-list-of-global-systemically-important-banks/ or www.fsb.org/wp-content/uploads/r_141106b.pdf

Table AIII.
Variable description

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