Banks' Discretion over the Debt Valuation Adjustment for Own Credit Risk

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Abstract

Banks that recognize financial liabilities at fair value currently must record unrealized gains (losses) on these liabilities attributable to increases (decreases) in the banks' own credit risk, referred to as the debt (or debit) valuation adjustment (DVA), in earnings each period. For a sample of publicly traded European banks during 2008-2013, we investigate the economic and discretionary determinants of DVA. We find that DVA exhibits the expected associations with economic factors, being positively associated with the change in banks' bond yield spread and negatively associated with the changes in banks' unsecured debt and average remaining bond maturity. We also provide evidence that banks exercised discretion over DVA to smooth earnings during the recent financial crisis and its immediate aftermath. To remove non-discretionary smoothing of earnings, we decompose DVA into nondiscretionary (normal) and discretionary (abnormal) components and find that abnormal DVA is negatively associated with pre-managed earnings, controlling for banks' abnormal loan loss provisions (LLP) and realized securities gains and losses (RGL), consistent with banks exercising discretion over DVA to smooth earnings. We further find that banks that record larger LLP and that have histories of using LLP to smooth earnings use DVA less to smooth earnings, consistent with LLP and DVA being substitutable ways to smooth earnings. These findings have implications for how bank regulators and investors should interpret banks' reported DVA. They may support the FASB's recent decision in ASU 2016-1 to require firms to record DVA in other comprehensive income.

Keywords: Debt valuation adjustment; DVA; Own credit risk; Fair value option for liabilities; Income smoothing

JEL Classifications: G18, G21, G28, K23, M41, M48

1. Introduction

In June 2005, the International Accounting Standards Board (IASB) issued *The Fair Value Option (Amendments to IAS 39)* and, in February 2007, the Financial Accounting Standards Board (FASB) issued Statement of Financial Accounting Standards (FAS) 159, *The Fair Value Option for Financial Assets and Financial Liabilities.*[1] Both of these standards provide reporting firms with the option to recognize eligible financial assets and financial liabilities at fair value, with periodic unrealized gains and losses recorded in earnings. The IASB's and FASB's main goal in allowing this fair value option (FVO) is to improve the consistency of the measurements and other aspects of the accounting for different types of financial instruments, particularly those involved in economic hedging relationships.

Despite this reasonable goal, the FVO has been subject to the following concerns, among others: (1) non-comparability may arise both across and within firms from optional accounting treatments; (2) firms may record "counterintuitive" gains (losses) on financial liabilities in periods that their own creditworthiness decreases (increases); (3) firms have limited ability to realize gains and losses on liabilities due to restrictions on transfer and because distressed firms with gains typically do not have the resources to buy back liabilities; and (4) firms have discretion over the estimation of gains and losses for financial instruments that do not trade in liquid markets, particularly liabilities due to restrictions on transfer and because the valuation adjustments for the reporting firm's own credit risk often are difficult to estimate (American Accounting Association Financial Accounting Standards Committee 2007, Barth et al. 2008). As a consequence of such concerns, the European Commission initially endorsed IAS 39 only after eliminating the FVO for financial liabilities.

[1] FAS 159 is now found in Accounting Standard Codification (ASC) Topic 825.

In this paper, we empirically examine recorded gains and losses on liabilities that are attributable to the changes in the reporting firm's own credit risk during the period, which are commonly referred to as the debt (or debit) valuation adjustment (DVA). DVA wholly underlies concern 2 above and partly underlies concerns 3 and 4. Regarding concern 2, whether DVA is "counterintuitive" for given firm in a given period depends on the extent to which the firm records an offsetting loss or gain on its assets in that period. Ideally, a firm that records a DVA gain (loss) in a period should record an offsetting loss (gain) on its assets in the same period, because the firm's own credit risk generally increases (decreases) when it experiences an economic loss (gain) on its assets. Moreover, firms' DVA generally should be less in absolute magnitude than their contemporaneous economic losses and gains on assets, because owners' equity generally absorbs a substantial portion of economic losses and gains. Firms may or may not record DVA and the corresponding economic losses and gains on assets in the same period, however, due either to limitations of accounting rules or to the firms' discretionary application of those rules. Barth et al. (2008) provide empirical evidence that their estimates of firms' DVA typically are smaller than the firms' recorded losses on assets.

Regarding concern 3, firms may not be able to realize DVA either because they are contractually prohibited from transferring liabilities or because they cannot retire liabilities before maturity due to limited resources or counterparty unwillingness. If a firm instead pays off a liability at its maturity, then the firm must reverse any DVA associated with the liability by that date.

The recent financial crisis and its recovery illustrate that DVA can dramatically affect banks' reported income. For instance, Morgan Stanley recorded a $6.4 billion DVA gain on its short- and long-term borrowings in fiscal years 2007 and 2008 (ending on November 30, 2008) as its bond spreads widened. Morgan Stanley largely reversed this gain by recording a

$5.8 billion DVA loss on these borrowings during December 2008 and fiscal year 2009 (ending on December 31, 2009) as these spreads tightened.[2] During the crisis, analysts paid close attention to the impact of DVA on reported earnings, raising red flags about DVA gains that allowed banks to beat analysts' forecasts and other earnings benchmarks.[3] Similarly, Basel III requires banks to eliminate the effect of DVA on their regulatory capital by derecognizing "all unrealized gains or losses that have resulted from changes in the fair value of liabilities that are due to changes in the bank's own credit risk" (paragraph 75, 2010, 2011).[4]

To date, accounting academics have provided limited theoretical analysis and empirical evidence regarding DVA, mostly focusing on its valuation implications. Lipe (2002) shows how DVA yields potentially misleading effects on accounting ratios as a firm approaches bankruptcy. Barth et al. (2008) and Chung et al. (2012) examine the value- and risk-relevance of DVA. Schneider and Tran (2011) examines the effect of DVA on information asymmetry. Gaynor et al. (2011) and Lachmann et al. (2011) use experimental methods to examine how investors evaluate DVA.

In this study, we provide the first evidence that banks exercise discretion over DVA to satisfy earnings management objectives, in particular, to smooth earnings. Our study contributes to the sizeable banking literature that examines banks' use of loan loss provisions (LLP) (e.g., Beaver et al. 1989, Beatty et al. 1995, Liu and Ryan 2006) and realized gains and losses on securities (RGL) (e.g., Beatty and Harris 1999, Dong et al. 2014) to manage income, regulatory capital, and taxes. This literature focuses "on asymmetric information between

[2] As a consequence of its September 2008 conversion to a financial holding company regulated by the Federal Reserve, Morgan Stanley changed its fiscal year end from November 30 to December 31 in December 2008; see Morgan Stanley's 2009 Form 10-K filing, p. 1.

[3] Keoun, B., and D. Henry, "Banks profits depend on debt-write-down abomination in forecast", www.bloomberg.com, July 11, 2010.

[4] The Basel Committee initially issued the Basel III rules in December 2010 and issued revised rules in June 2011, www.bis.org/publ/bcbs189.pdf.

banks and equity investors and between banks and regulators" (Beatty and Liao 2014, p. 339). To demonstrate banks' distinct use of DVA versus LLP and RGL to manage income, we conduct analyses that control for LLP and RGL and that interact DVA with proxies for how banks use LLP and RGL to manage earnings.

An issue in this analysis is that, absent discretion, DVA smoothes earnings if, when a firm's creditworthiness deteriorates (improves), the firm records losses (gains) on its assets that are comparable to or larger than its DVA gains (losses). To address this issue, we specify and estimate the non-discretionary (normal) and discretionary (abnormal) components of DVA, and we focus the empirical analysis primarily on abnormal DVA. Furthermore, we employ a proxy for Barton and Simko's (2002) notion of balance sheet constraints on the exercise of discretion over DVA, namely, cumulative DVA as of the beginning of the period.[5] To compare DVA, LLP, and RGL as alternative ways for banks to manage income, we analogously specify and estimate normal and abnormal LLP and RGL and proxy for balance sheet constraints on banks' exercise of discretion over LLP and RGL.

We conduct three empirical analyses. First, we specify and estimate models of the non-discretionary and discretionary determinants of banks' DVA, LLP, and RGL. Second, we test the hypothesis that banks exercise discretion over DVA to smooth earnings. Similar to extensive prior research (e.g., Collins et al. 1995), we conduct this test by regressing pre-managed earnings, defined as operating income before DVA, on banks' abnormal DVA, controlling for abnormal LLP and RGL. Third, we test whether banks' exercise of discretion over DVA, LLP, and RGL depends on proxies for their prior use of these variables to manage earnings. In this analysis, to capture financial analysts' concerns that banks used DVA to meet earnings targets during the financial crisis, we subdivide the sample into the financial crisis including its immediate aftermath (2008-2010) and the subsequent recovery (2011-2013).

[5] Throughout the paper, DVA without any modifier refers to the gain (positive DVA) or loss (negative DVA) on liabilities during the period attributable to changes in the reporting firm's own credit risk. Cumulative DVA refers to the sum of DVA up to a point in time, typically the beginning of the period under consideration.

Our sample includes all European listed banks for the years 2008-2013. We obtain most bank-level variables from DataStream and Capital IQ. We hand collect DVA from bank's annual reports. During the sample period, 25 sample banks report non-zero DVA in at least one year. Bank-year observations with non-zero DVA represent about 15 percent of the sample, a similar percentage as in the US (Cedergren et al. 2015). Typically, DVA is positive during the financial crisis and negative in subsequent years.

In the first analysis, we find that DVA is negatively associated with cumulative DVA at the beginning of the year, positively associated with the change in banks' bond spread during the year, and negatively associated with the changes in banks' unsecured debt and average remaining bond maturity during the year. These findings are consistent with less creditworthy firms generating more earnings-increasing DVA. In the second analysis, we find that abnormal DVA is negatively associated with pre-managed earnings during the financial crisis and its immediate aftermath, consistent with banks exercising discretion over DVA to smooth earnings during that period. In the third analysis, we find that banks with high LLP or that aggressively smooth earnings using LLP exercise less discretion over DVA to smooth earnings, consistent with LLP and DVA being substitutable ways to smooth earnings. In contrast, we do not find a significant interaction between DVA and RGL.

To the best of our knowledge, our paper makes two primary contributions to the literature on fair value accounting and bank reporting. First, our paper is the first to document that banks use DVA to smooth earnings. Second, our paper is the first to examine interactions among three significant discretionary accounting variables for banks: LLP, RGL and DVA. We find that abnormal DVA and abnormal LLP are substitutable ways for banks to smooth earnings.

Our results have significant and timely implications for accounting standard setters, bank regulators, and other users of financial reports. In July 2014, IASB revised IFRS 9,

Financial Instruments, and in February 2016, the FASB issued Accounting Standards Update (ASU) 2016-1, *Recognition and Measurement of Financial Assets and Financial Liabilities*, both of which require that changes in the fair value of financial liabilities attributable to the reporting firm's own credit risk be recorded in other comprehensive income, rather than in net income. Our findings that banks use DVA to manage earnings provide support for these revisions, as well as for Basel III rules that remove DVA from the calculation of the regulatory capital ratios.

The remainder of this paper is as follows. Section 2 discusses relevant background and prior literature related to our study, and Section 3 develops the hypotheses. Section 4 describes the research design and sample selection. Section 5 discusses the empirical results and Section 6 concludes.

2. Background and related literature

This study draws on and contributes to two streams of accounting literature: (1) the market's evaluation of firms' recognized fair values and unrealized gains and losses for liabilities, including DVA; and (2) firms' exercise of discretion over accounting variables. We review the prior literatures on these topics, focusing on the studies examining banks.

2.1 Fair valuation of liabilities and debt valuation adjustment (DVA)

Around 2000, the IASB's predecessor, the International Accounting Standards Committee (IASC), and FASB both expressed the goal to expand fair value accounting to most financial instruments.[6] While political pressures have significantly deterred the IASB's and FASB's achievement of this goal, the standard setters made a partial step toward it by providing firms with the option to elect to account for most financial instruments at fair value.

[6] See FASB, *Preliminary Views on Major Issues Related to Reporting Financial Instruments and Certain Related Assets and Liabilities at Fair Value*, December 1999; and the Joint Working Group of Standard Setters (in which both the IASC and FASB were members, along with many other countries' accounting standard setters) *Recommendations on Accounting for Financial Instruments and Similar Items*, December 2000.

Specifically, in June 2005 the IASB amended IAS 39 to allow firms to irrevocably elect at the inception of individual non-marketable financial instruments to recognize the instruments at fair value, with periodic unrealized gains and losses reported in earnings, when at least one of the following three eligibility criteria obtains: (1) the elections remedy accounting mismatches, (2) firms manage the instruments on a fair value basis, and (3) the instruments contain embedded derivatives. IFRS 9, which will replace IAS 39 effective as of 2018, maintains this FVO.[7] In February 2007, the FASB issued the generally similar FAS 159, although this standard does not require firms' FVO elections to meet eligibility criteria and has somewhat different scope.

Accounting academics have conducted considerable empirical research to date on the equity value- and risk-relevance of recognized fair value measurements and unrealized gains and losses for financial instruments (see Ryan 2011, Sections 4.4-4.6, and Beatty and Liao 2014, Section 4.2, for recent summaries of this literature). Much of this research examines either or both of (1) banks or other types of financial institutions, because financial instruments constitute high proportions of their assets and liabilities; and (2) available-for-sale investment securities, the only type of financial instrument recognized at fair value that is widely held by non-banks.

Reflecting this last point, relatively few firms recognize financial liabilities at fair value (Barth et al. 2008; Beatty and Liao, 2014). This is because, aside from derivative liabilities, the normal measurement basis for financial liabilities generally is amortized cost, and firms rarely elect the FVO for liabilities. For example, Widmer (2014) reports that only about 9.69% (6.75%) of European banks elected the FVO for liabilities in 2006 (2012). Similarly, Guthrie et al. (2011) identify only 72 of 1500 firms in the US that elected the FVO for any asset or liability in 2007 and 2008, while Chang et al. (2011) find that, of 57 banks

[7] The IASB has twice deferred the effective date of IRFS 9. The most recent deferral in 2014 set a date of January 1, 2018.

that elected the FVO option for any item in 2007 or 2008, only 27 elected the FVO for financial liabilities. Firms naturally can report materially non-zero DVA arising from their elections of the FVO for liabilities no more frequently than they make these elections.

While the definition of DVA under IFRS and US GAAP is straightforward, i.e., DVA reflects changes in fair value of liabilities due to changes in the reporting firm's own credit risk, the estimation of valuation adjustments for credit risk often involves significant data observability and analytical difficulties. To increase the reliability of fair value estimates, both IFRS (i.e., IFRS 9, 13) and US GAAP (FAS 157) require firms make these estimates maximizing the use of observable market inputs. However, critical sources of market information about firms' credit risk, such as credit ratings and quoted CDS spreads, are unavailable, stale, or indicative for many entities. Even when CDS spreads are available, CDS involve bilateral credit exposures (e.g., CDS purchasers may default on periodic premia) that must be disentangled, as well as contractual features (e.g., cheapest-to-deliver options) that do not apply to the liabilities for which the FVO is elected. Due to limited data observability, the estimation of DVA requires considerable sophistication and judgment in practice (i.e., Ernst & Young, 2013). For example, Ernst & Young (2014) states "in the absence of any observable indicator of creditworthiness, a reporting entity may be required to combine a number of factors to arrive at an appropriate credit valuation adjustment." These data observability and analytical difficulties provide reporting firms with avenues to exercise discretion over DVA, and they limit outsiders' ability to discipline that discretion.

As discussed above, the IASB's and FASB's primary intent in IAS 39 and FAS 159, respectively, is to remedy accounting mismatches for economically offsetting positions. Several studies provide evidence that many firms use the FVO as the standard setters' intend, thereby reducing their earnings volatility and information asymmetry. For example, on a sample of 222 international banks, Fiechter (2011) finds that 131 banks elect the FVO for

some item under IAS 39 in 2007, and that 54 of these banks elected the FVO primarily to remedy accounting mismatches. He further finds that these 54 banks exhibit lower earnings volatility than the other sample banks. Schneider and Tran (2015) find that European banks that elected the FVO for liabilities under IAS 39 in 2006-2010 (262 bank-year observations) exhibit lower information asymmetry, as reflected in smaller equity bid-ask spread, than do banks that did not make this election (191 bank-year observations). Schneider and Tran (2015) find this result both for 130 bank-year observations that record non-zero DVA and the 132 observations that record zero DVA, suggesting that investors do not perceive recognition of DVA as an improvement in transparency. Schneider and Tran's (2015) analysis is limited by their use of an indicator variable for DVA, not its magnitude.

In contrast, Song (2008), Henry (2009), Guthrie et al. (2011), and Chang et al. (2011) provide evidence that some early adopters of FAS 159 attempted to exploit the standard's transition guidance—which allowed firms adopting the standard up to four months after the beginning of the adoption quarter to identify instruments with cumulative losses for FVO election and to record those losses directly in retained earnings—but that the SEC quashed that behavior in April 2007. These studies find no evidence that regular adopters opportunistically elected the FVO. Due to the requirement to elect the FVO at the inception of financial instruments, it is difficult for firms to elect the FVO opportunistically after their initial adoption of the standard (Chang et al. 2011). Of course, the fair values of financial instruments that do not trade in liquid markets typically can be measured with some degree of discretion.

Due to the limited number of firms reporting non-zero DVA, the literature to date provides only limited evidence about the market implications of DVA. We describe three papers that provide such evidence below.

Barth et al. (2008) apply Merton's (1974) theoretical framework, in which increases in a firm's credit risk transfer wealth from the firm's creditors, who disproportionately bear losses from downside realizations of risk (corresponding to DVA gains for the firm), to the firm's equityholders, who disproportionately reap gains from upside realizations of risk. Barth et al. (2008) empirically demonstrate this risk transfer for a sample that excludes financial institutions. They find that the negative association between equity returns and changes in credit risk is lower for more leveraged firms for which creditors bear relatively more downside risk. Barth et al. (2008) also provide descriptive analysis that if firms reported DVA gains estimated using the Merton model, then on average the firms' net income would not change sign, consistent with these gains being more than offset by reported losses on assets. Barth et al. (2008) must estimate DVA because their sample period is 1986–2003, during which US GAAP did not require (or prohibit) that firms' own credit risk be incorporated into estimated fair value for liabilities and (thus) did not require disclosure of DVA.[8]

For a sample of 95 firm-quarter observations of US firms (mostly banks and other financial firms) reporting non-zero DVA from 2007Q4-2010Q4, Chung et al. (2012) report that stock returns are positively associated with DVA. Cedergren et al. (2015) provide evidence that the sign of the association of banks' stock returns with DVA depends on the extent to which the firm has unrecognized intangible assets. Cedergren et al. (2015) examine a sample of 46 US bank holding companies that report non-zero DVA at least one quarter during 2007-2013; of these 818 total bank-quarter observations, 193 report non-zero DVA. Cedergren et al. (2015) find that stock returns are positively (negatively) associated with DVA when unrecognized intangible assets are low (high), consistent with DVA gains and losses being "counterintuitive" only when the firm does not report more than offsetting losses and gains on assets.

[8] See FAS 157, paragraphs C42-C49 for description of the pre-FAS 157 guidance regarding the fair value measurement of liabilities with respect to the report firm's own credit risk.

Several recent studies employ experimental methods to examine users of financial reports' evaluation of DVA. For example, Gaynor et al. (2011) provide evidence that over 70% of users (proxied by CPAs) misinterpret DVA gains (losses) as improvements (deterioriations) of firms' credit risk even when provided "basic" disclosures that indicate the amounts of and qualitative reasons for these gains and losses. These results are consistent with the view that DVA gains and losses are "counterintuitive." Gaynor et al. (2011) also provide evidence that additional "relational" disclosures that indicate the direction of the relation between credit risk changes and DVA significantly reduce but do not eliminate these misinterpretations.[9] [10]

2.2. Accounting discretion in banking

Loan loss provision (LLP)

In their reviews of the bank accounting literature, Ryan (2011) states that "the first and still most extensive bodies of empirical financial accounting research on banks examine their exercise of discretion over the ALL and PLL [i.e., the allowance and provision for loan losses]" (p. 29), and Beatty and Liao (2014) state that "the loan loss provision plays a prominent role in much of the bank accounting literature" (p. 353). This prominence is attributable to LLP being the largest and most judgmental accrual estimate for most banks. Compared to outsiders, bank managers have superior information about the credit quality of the bank's loans as well as the most appropriate inputs and models to use in estimating LLP.

[9] Lachmann et al. (2011) conduct a similar study as Gaynor et al. (2011) but use masters students (rather than CPAs) as the participants. Lachmann et al. (2011) find that students taking masters-level accounting classes take considerable time to process DVA-related information.

[10] Koonce et al. (2011) employ experimental methods to examine the broader question of whether the response by investors (proxied by MBA students) to recognized fair values and reported unrealized gains and losses exhibit biases predicted by counterfactual reasoning theory from psychology. Koonce et al. (2011) predict and find that investors react more to recognized fair values for assets than for liabilities, due to firms' greater ability to influence the value of assets (i.e., to achieve the counterfactual result). Koonce et al. (2011) predict that investors reaction more to losses than to gains, due to the greater salience of loss prevention (i.e., to achieve the counterfactual result), but they find no difference in investors' reaction to gains versus losses.

Ryan (2011, Section 3.3) and Beatty and Liao (2014, Sections 5.1-5.2) provide recent surveys of the large literature that show that banks exercise discretion over LLP to smooth or otherwise manage income, to increase regulatory capital, and to reduce taxes. These studies employ a wide range of research designs (e.g., cross-sectional in Beatty et al. 1995 and time-series in Collins et al. 1995) and contextual settings (e.g., public versus private banks in Beatty et al. 2002 and across the business cycle in Liu and Ryan 2006). These studies often estimate the nondiscretionary portion of LLP as a function of variables such as the growth in total loans, change in non-performing assets, loan charge-offs, beginning allowance for loan losses, and macroeconomic variables, and the studies estimate the discretionary portion of LLP as the residuals from these models. See Bhat et al. (2016) for a recent development and estimation of such models by type of loan.

Realized gains and losses (RGL)

The next most important and extensively examined avenue for banks to exercise accounting discretion is through selective realization of gains and losses on financial instruments recognized at amortized cost (i.e., much of banks' financial assets and almost all of their financial liabilities) or for which unrealized gains and losses are recorded in (accumulated) other comprehensive income. This behavior is often referred to as "gains trading." Ryan (2011, Section 4.5) and Beatty and Liao (2014, Section 5.3.1) provide recent surveys of the literature that show that banks exercise discretion over RGL, particularly for available-for-sale (AFS) securities, to smooth or otherwise manage income, to increase regulatory capital, and to reduce taxes. This literature employs similarly varied research designs and examines similar contexts as the literature on banks' LLPs discussed above.

Much of the literature examines realization of gains and losses on marketable securities for samples drawn prior to FAS 115's (1993) requirement that AFS securities be recognized at fair value and that both unrealized and realized gains and losses on these

securities be disclosed in the notes to financial statements. *A fortiori*, these samples are drawn prior to FAS 130's (1997) requirement that unrealized gains and losses on AFS securities be prominently disclosed in financial statements. Dong and Zhang (2014) provide evidence that firms continue to engage in significant gains trading using AFS securities after the effective dates of these standards.

DVA

When a bank elects the FVO for liabilities, absent discretion the bank reports DVA gains (losses) when its creditworthiness decreases (increases). If and to the extent that a firm records losses (gains) on its assets when the firm's creditworthiness deteriorates (improves) that are comparable to or larger than its DVA gains (losses), DVA will smooth earnings even in the absence of discretion. In addition, banks may exercise their considerable discretion over DVA estimation described above to accentuate this income smoothing or to otherwise manage income.

To date, the literature provides no evidence about either the economic or discretionary determinants of DVA. As discussed below, we expect firms reported DVA to be explained in part by economic determinants such as changes in their credit risk and in economic conditions. We predict that firms' ability to exercise discretion over DVA leads them to use DVA to smooth earnings, similar to the findings of prior research regarding banks use of discretion over LLP and RGL.

3. Hypotheses

We first examine whether proxies for changes in the creditworthiness of banks that elect the FVO for liabilities explain their reported DVA, i.e., whether DVA has a non-discretionary component that corresponds to the stated intent of the FVO in IAS 39 and FAS 159. We expect this to be the case to some extent, at least, and so we hypothesize that when a

bank's creditworthiness improves (deteriorates), the fair value of its debt increases (decreases), yielding an unrealized loss (gain).

H1: (Normal) DVA is negatively associated with proxies for changes in the creditworthiness of banks that elect the FVO for liabilities.

We next examine whether banks that elect the FVO for liabilities exercise discretion over DVA to smooth earnings. We expect this to be the case for several reasons. First, income smoothing using DVA would not stand out as discretionary, because DVA may smooth earnings even in the absence of discretion, as discussed above. Moreover, the impact of DVA in a given period naturally reverses in subsequent periods as economic conditions mean revert or firms take actions to improve their creditworthiness; such a reversal occurs in the example of Morgan Stanley in 2007-2008 versus 2009 discussed in the introduction. Second, the estimation of DVA involves significant data observability and analytical difficulties discussed in Section 2.1 that limit the ability of banks' auditors, supervisors, investors, and other outsiders to discipline banks' exercise of discretion over DVA.

Third, and relatedly, the financial statement presentation and overall financial report disclosure of DVA—which during the entirety of our sample period was reported aggregated with other unrealized gains and losses on liabilities in the financial statements and was disclosed in various non-standardized forms, such as those provided in Appendix I—is relatively opaque compared to the required financial report information about LLP and RGL, banks' other primary discretionary accounting variables.[11] In particular, GAAP requires banks to prominently present LLP and RGL on separate lines on the financial statements, and GAAP and SEC Industry Guide 3 require banks to clearly disclose these variables in notes to the financial statements or the MD&A section of financial reports, respectively. Prior research shows that firms' exercise of discretion over an item decreases with the prominence and

[11] This state of affairs will change to some extent in 2018, when the July 2014 amendment of IFRS 9 and ASU 2016-01 become effective.

extent of the disclosure of the item in financial reports. For example, Dong and Zhang (2014) find that banks are less likely to gains trade using AFS securities when RGL are reported in the more prominent and less aggregated statement of other comprehensive income than in the statement of shareholders' equity.

Banks may exercise discretion over DVA to manage income in various ways. Based on the large banking literature that shows banks exercise discretion over LLP and RGL to smooth earnings discussed in Section 2.2, we hypothesize that banks exercise discretion over DVA to smooth earnings:

H2: (Abnormal) DVA is negatively associated with banks' pre-managed income.

Lastly, we examine the interactions between banks' exercise of discretion over DVA and their exercise of discretion over LLP and RGL. This examination responds to Fields et al.'s (2001) criticism that most studies on accounting choice only examine a single choice. It also conforms to Beatty and Liao's (2014) observation that studies on banks often consider multiple reporting choices.

These interactions could take various possible forms. One natural possibility is that banks have "pecking orders" regarding the exercise of discretion over the three variables. That is, banks use the most preferred of these variables to smooth earnings until that variable hits a balance sheet or other constraint (Barton and Simko 2002), and then move on to the next most preferred variable. For example, banks might prefer to smooth earnings using LLP and RGL rather than DVA, either because DVA is a relatively unusual item (i.e., it requires banks to elect the FVO for liabilities, and many banks exhibit aversion to any form of fair value accounting) or because DVA pertains to the banks' own creditworthiness, something banks generally want outsiders to believe is high. Perhaps for the latter reason, banks often report that the impact of own credit risk in the valuation of debt or derivative liabilities is immaterial (Deloitte, 2013). Another natural possibility is that banks exhibit a continuum of

accounting styles with respect to the exercise of discretion. On one end of the continuum are banks that actively use all three variables to smooth earnings. On the other end are banks that do not use any of the variables to smooth earnings. Consistent with this possibility, Chang et al. (2011) find that firms that have a history of managing earnings through the realization of gains or losses on available-for-sales (AFS) securities are more likely to make opportunistic FVO decisions.

Because the prior literature does not provide clear guidance as to which of these or other forms of interaction is most likely to explain variation in DVA, we propose the following general and non-directional hypothesis:

> *H3: Banks' exercise of discretion over (abnormal) DVA to smooth earnings is associated with their exercise of discretion over LLP and RGL on AFS securities.*

4. Empirical Models and Research Design

The income statement of a typical bank consists of four main components: (1) net interest income, (2) loan loss provision (LLP), (3) net non-interest income, and (4) realized securities gains and losses (RGL). As discussed in Section 2.2, LLP is the component that has been most extensively examined in the prior bank accounting literature (e.g., Wahlen 1994; Beatty et al. 1995; Liu and Ryan 1995; Beatty et al. 2002). Similar to that literature, we estimate the nondiscretionary (normal) LLP as a linear function of the lagged loan loss allowance (to capture prior reserving) and the lagged level of and current change in non-performing assets (to capture loan performance):

$$LLP = a_0 + a_1 L\_ALW + a_2 L\_NPA + a_3 \Delta\_NPA + e \quad (1)$$

LLP denotes the annual loan loss provision divided by beginning-of-year total loans. *L_ALW* denotes the lagged annual loan loss allowance divided by beginning-of-year total loans. *L_NPA* denotes lagged nonperforming assets divided by beginning-of-year total loans.

Δ_NPA denotes the annual change in nonperforming assets divided by beginning-of-year total loans.

Banks' next most extensively studied income component is RGL (e.g., Beatty and Harris 1999). In the absence of discretion, banks' RGL should be explained primarily by their cumulative unrealized gains and losses available to be realized (Ryan, 2007). Following Beatty et al. (2002), we estimate the nondiscretionary (normal) portion of RGL as a linear function of the natural logarithm of total assets and cumulative unrealized gains and losses on AFS securities:

$$RGL = a_0 + a_1 LN\_TA + a_2 UNGL + e \qquad (2)$$

RGL denotes realized security gains and losses divided by beginning-of-year total assets. *LN_TA* denotes the natural logarithm of total assets. *UNGL* denotes cumulative unrealized gains and losses on AFS securities divided by beginning-of-year total assets.

To the best of our knowledge, no prior study develops a model for nondiscretionary (normal) DVA. To this end, we model DVA as a linear function of a proxy for banks' *prior* recording of DVA and various proxies for changes in banks' creditworthiness. We proxy for banks' prior recording of *DVA* using beginning-of-year cumulative DVA. We expect DVA to mean revert over time and thus to be negatively associated with beginning cumulative DVA. Such mean reversion could occur due to non-discretionary factors such as banks taking actions (e.g., selling assets or issuing equity) that reduce credit risk when it is high or the economic conditions affecting banks mean reverting. It could also reflect banks' exercise of discretion over DVA reversing over time, perhaps due to Barton and Simko's (2002) notion of a balance sheet constraint on banks' exercise of discretion over DVA, i.e., the balance sheet amount "partly reflects the extent of previous earnings management" (p. 1).

We proxy for changes in banks' creditworthiness using the following variables. First, we include the percentage change in credit rating (Barth et al. 2008), where a better rating is

coded as a higher number, which we expect to be negatively associated with DVA.[12] Second, we include two proxies for the change in banks' financial leverage, the change in unsecured debt, and the change in long-term derivative liabilities. The sign of the associations of DVA with these proxies could be negative if the proxies primarily capture healthier banks being better able to issue liabilities or positive if the proxies primarily capture a given bank's own credit risk rising with its leverage. Third, we include two proxies for the change in the credit risk of the banks' traded bonds, the change in banks' average bond yield spread minus the risk-free US Treasury bond rate with the same maturity (Barth et al. 2012) and the change in banks' average remaining bond maturity. We expect DVA to be positively (negatively) associated with the changes in banks' average bond yield spread (average remaining bond maturity).[13]

Based on the discussion above, the model for the determinants of DVA is:

$$DVA = a_0 + a_1 L\_CDVA + a_2 \Delta\_CREDIT + a_3 \Delta\_UNSECDEBT + a_4 \Delta\_LTDERLIAB + a_5 \Delta\_YIELDSPREAD + a_6 \Delta\_MATURITY + e \quad (3)$$

DVA denotes DVA before tax divided by beginning-of-year total assets.[14] *L_CDVA* denotes the beginning-of-year cumulative balance of *DVA* divided by beginning-of-year total assets. *Δ_CREDIT* denotes the percentage change in the credit rating during the year. *Δ_UNSECDEBT* denotes the change in unsecured debt divided by beginning-of-year total assets. *Δ_LTDERLIAB* denotes the change of non-current derivative liabilities divided by beginning-of-year total assets. *Δ_YIELDSPREAD* denotes the change in banks' average bond yield spread. *Δ_MATURITY* denotes banks' average remaining time to bond maturity.

[12] A DDD (AAA) credit rating is coded 1 (24).

[13] While the credit risk of a bond increases with its maturity, all else being equal, theory indicates that debt maturity decreases with borrower credit risk above a threshold level of credit risk (Diamond 1991). This theory is supported by extensive empirical evidence (e.g., Mitchell 1993, Berger et al. 2005).

[14] Some banks report DVA both before and after tax, while others report only one of the before- and after-tax amounts. In the latter case, we use either a 35% tax rate or the bank's effective tax rate to infer the missing amount. The results are not sensitive to the choice of the tax rate.

In some analyses, we replace *L_CDVA* in equation (3) with its non-discretionary (normal) and discretionary (abnormal) components. We estimate these components using a model similar to equation (3), with the dependent variable measured in the same period as the explanatory variables, which are included in levels rather than changes form.

$$L\_CDVA = a_0 + a_1 CREDIT + a_2 UNSECDEBT + a_3 LTDERLIAB + a_4 YIELDSPREAD + a_5 MATURITY + e \quad (4)$$

We estimate equations (1)-(4) pooling across years and including year fixed effects. Using the estimations of equations (1)-(3), we calculate normal (abnormal) *LLP*, *RGL*, and *DVA* as the predicted values of the dependent variables (residuals) in the equations. We denote the normal variables by the prefix "*NOR_*" and the abnormal variables by the prefix "*ABN_*".

We examine banks' exercise of discretion over DVA to smooth earnings, first in isolation (i.e., to test H2) and then in conjunction with banks' exercise of discretion over LLP and RGL (i.e., to test H3), using the following two equations. In the first equation, we regress pre-managed income on: (1) *NOR_DVA* and *ABN_DVA* to capture whether and how banks' normal and abnormal DVA, respectively, smooth earnings; (2) *ABN_LLP* and *ABN_RGL*, to capture banks' exercise of discretion over LLP and RGL to smooth earnings; and (3) controls for lagged operating income, to capture the persistence of earnings absent discretion, and for the lagged book-to-market ratio, to capture earnings growth absent discretion.

$$PREMANAGED\_INC = a_0 + a_1 ABN\_DVA + a_2 NOR\_DVA + a_3 ABN\_LLP + a_4 ABN\_RGL + a_5 L\_OI + a_6 L\_BTM + e \quad (5)$$

PREMANAGED_INC denotes operating income before DVA divided by beginning-of-year total assets. *NOR_DVA* (*ABN_DVA*) denotes normal (abnormal) *DVA* estimated as the fitted value (residual) from equation (3). *ABN_LLP* denotes abnormal *LLP* estimated as the residual from equation (1). *ABN_RGL* denotes abnormal *RGL* estimated as the residual from equation

(2). *L_OI* denotes lagged operating income divided by beginning-of-year total assets. *L_BTM* denotes lagged book value of owners' equity divided by lagged market value of owners' equity. We include year fixed effects in equation (5) and report robust standard errors.

We test how banks' exercise of discretion over DVA interacts with their exercise of discretion over LLP and RGL in two ways. First, we indicate bank-year observations with values of *LLP* above (below) its median with the indicator variable *H_LLP* taking a value of 1 (0). Similarly, we indicate bank-year observations with values of *RGL* below (above) its median with the indicator variable *L_RGL* taking a value of 1 (0). Notice that we code high *LLP* and low *RGL* similarly, because they have the same directional effect on earnings. *H_LLP* and *L_RGL* might capture either Barton and Simko's (2002) notion of balance sheet constraints on banks' exercise of discretion over an accounting variable or firms' revealed preference to exercise discretion over an accounting variable. We add these indicators to the right hand side of equation (5) both individually and interactively with *NOR_DVA* and *ABN_DVA*.

$$\begin{aligned} PREMANAGED\_INC \;=\; & a_0 + a_1 ABN\_DVA \; + a_2 NOR\_DVA \; + a_3 H\_LLP + \\ & a_4 ABN\_DVA \; * H\_LLP + a_5 NOR\_DVA * H\_LLP + \\ & a_6 L\_RGL + \; a_7 ABN\_DVA * L\_RGL + a_8 NOR\_DVA * L\_RGL + \\ & Controls + e \end{aligned} \qquad (6)$$

Second, motivated by Collins et al.'s (1995) evidence that banks vary in their exercise of discretion over LLP and RGL, we estimate the associations of *PREMANAGED_INC* with *LLP* and *RGL* for each bank over the seven sample years. We classify banks with positive (negative) coefficients on *LLP* (*RGL*) as earnings smoothers, and those with the opposite coefficients as non- or anti-earnings smoothers. We code banks that smooth earnings using LLP (RGL) by the indicator variable *LLP_SMOOTH* (*RGL_SMOOTH*) taking a value of one,

and non- or anti-earnings smoothers by these indicators taking a value of zero. We estimate a model analogous to equation (6) that substitutes these indicators for *H_LLP* and *L_RGL*.

5. Empirical analysis

5.1 Sample, data, and descriptive analysis

Our sample includes all banks that are primarily listed on stock exchanges in Europe, a total of 235 banks as of year-end 2013. The vast majority of these banks prepare financial reports using IFRS; several banks report under US GAAP because they cross-list in the US and/or focus on US business operations. We estimate each model using all bank-year observations with available data on the variables in that model. We obtain most variables from DataStream and Capital IQ. We obtain credit ratings from Asset4, filling in missing values for rated banks from various other sources, and using Barth et al.'s (2008) approach to estimate credit ratings for unrated banks.[15]

Because information about European banks' DVA is not available on any machine-readable database, we hand-collected this information from the sample banks' annual financial reports from 2008-2013, which we downloaded from their websites.[16] Because neither IFRS nor the European Central Bank (ECB) requires European banks to disclose DVA in a standardized location or format,[17] and in practice these banks use various approaches, we located the DVA information in these financial reports by searching using key words such as "DVA", "own credit", "own debt" and "fair value adjustment." We observed considerable variation in both the location and format of DVA disclosure. Notably, early in our sample

[15] Barth et al. (2008) model firms' credit ratings as a function of the following accounting variables: total assets, return on assets, debt divided by total assets, and indicator variables for positive dividend payout, the existence of subordinated debt, and the sign of net income. They estimate that model for firms with credit ratings and use the predicted credit rating from that estimated model for firms without credit ratings.

[16] For completeness, we also checked the sample banks' interim reports for DVA information.

[17] In the US, by contrast, the Federal Reserve requires bank holding companies to report their net gains or losses on liabilities attributable to changes in their own credit risk during the year in their regulatory FR Y-9C filings. These filings are available in machine-readable form from various sources. Research on DVA for US banks typically obtains DVA data from one of these sources (e.g., Chung et al. 2012; Cedergren et al. 2015).

period some banks appear to have interpreted and disclosed the debit valuation adjustment (i.e., DVA) as the valuation adjustment for counterparty credit risk on assets (i.e., accounts with debit balances), which is properly referred to as Credit Valuation Adjustment (CVA);[18] we excluded these bank-year observations from the sample. Many of the sample banks provide both DVA for the period and the cumulative DVA since their election of the FVO for liabilities. In contrast, in the US banks report only DVA for the period in their FR Y-9C reports. Appendix 1 provides some representative examples of the sample banks' DVA disclosures.

This search yields 25 banks, listed in 12 European countries, that report non-zero DVA in at least one year during the sample period. To preserve observations of DVA, when one of these banks does not report a non-zero DVA amount in a sample year, we assume that DVA is zero for that bank in that year rather than treat that observation as missing. The samples used to estimate the models that involve DVA are limited to (at most) the 118 bank-year observations for these banks, approximately 15% of the number of bank-year observations in the samples used to estimate the models that do not involve DVA (i.e., equations (1) and (2)). The banks that report non-zero DVA typically are large, however, and they represent about 67% of the total assets of the sample as of December 31, 2013. The relatively few observations in the models involving DVA naturally reduce the power of the tests.

To mitigate the influence of outliers, each continuous variable in equations (1)-(6) is winsorized at the 1% and 99% levels of its distribution.

Table 1 presents the sample breakdown by country and reporting year. The number of non-zero DVA-reporting banks increases over the sample period, from 9 banks in 2008 to 25 banks in 2013. This increase in part reflects the fact that once a bank reports DVA in a year, it

[18] To avoid such misunderstanding, we and most analysts refer to DVA as the "debt valuation adjustment" rather than the "debit valuation adjustment."

typically continues to report DVA in subsequent years. Non-zero DVA-reporting bank-year observations are fairly well dispersed across countries, from a minimum of 3 bank-year observations in Greece to a maximum of 21 bank-year observations in the UK.

Insert Table 1 here

Figure 1 depicts the averages of *DVA* (Panel A) and cumulative *DVA* (Panel B) in each of the sample years. The averages of *DVA* and cumulative *DVA* both take their most positive values in 2008, reflecting the fact that the end of 2008 coincided with the approximate middle of the post-Lehman bankruptcy filing depths of the crisis. Reflecting the economic recovery occurring in the second half of 2009, average *DVA* in 2009 is negative, which causes average cumulative *DVA* to drop sharply by the end of the year. In contrast, in 2010 and 2011 average *DVA* is positive, which causes average cumulative *DVA* to rise during these years. This suggests that the market and banks initially perceived the recovery in 2009 to be stronger than it subsequently turned out to be. In 2012 and 2013, average *DVA* is negative, and by the end of 2013 average cumulative *DVA* falls below zero, presumably reflecting banks' issuance of debt during the crisis or its aftermath at higher credit spreads than existed at the end of 2013.

Insert Figure 1 here

Figure 1, Panel C depicts the numbers of banks reporting positive versus negative *DVA* in each year. Consistent with the averages just discussed, more banks report positive than negative *DVA* in 2008, 2010, and 2011, and the opposite in 2009, 2012, and 2013.

Figure 2, Panel A depicts average *DVA* for each country across the sample period. Banks from Luxembourg, Ireland, Portugal, Greece, and Belgium report much more positive average DVA than do Sweden, France, Switzerland, Denmark, Italy, and the United Kingdom. This suggests that country-level economic, institutional, or cultural features influence banks' reported DVAs.

Insert Figure 2 here

Table 2 reports descriptive statistics for all of the variables in equations (1)-(6); the notes to this table provide the definitions of these variables. The numbers of observations vary across these variables, primarily because observations are lost estimating the earnings smoothing style variables, *LLP_SMOOTH* and *RGL_SMOOTH*, as well as in decomposing *DVA* into its normal and abnormal components.

The variables in changes form and the abnormal variables generally exhibit good variation and reasonable symmetry. In contrast, as is common in banking research, some of the levels variables, such as *LLP*, *RGL*, and *MTB*, are skewed right. Consistent with prior literature, the mean of *LLP* is 0.0089 and the mean of *RGL* is 0.0007.

Insert Table 2 here

Table 3, Panels A-C, report descriptive tests of differences of the mean of *ABN_DVA* for sample partitions based on the levels of variables related either to hypothesis H2 that banks exercise discretion over DVA to smooth earnings or to hypothesis H3 that banks' exercise of discretion over *DVA* is related to their exercise of discretion over *LLP* and *RGL*. Specifically, Panel A (B) [C] reports the tests for sample partitions based on *PREMANAGED_INC* (*LLP* and *RGL*) [*LLP_SMOOTH* and *RGL_SMOOTH*]. Each of these partitioning variables is classified as "High" ("Low") if its value is above (below) its pooled sample median. The *t*-test columns of the table report the mean of *ABN_DVA* for the High group minus the mean of *ABN_DVA* for the Low group, the *t*-statistic for this difference in parentheses, and whether the two-tailed significance level of this *t*-statistic is 1%, 5%, or 10% with three, two, or one asterisks, respectively.

Panel A reports that the mean of *ABN_DVA* is significantly lower at the 10% level when *PREMANAGED_INC* is High than when it is Low (*t*-statistic = -1.8). This result is consistent with banks exercising discretion over *DVA* to smooth earnings, as postulated in H2.

That is, when *PREMANAGED_INC* is high (low), DVA tends to reduce (increase) earnings.

Panel B reports that the mean of *ABN_DVA* is significantly higher at the 10% level when *LLP* is High than when it is Low (*t*-statistic = 1.8). This result is consistent with banks exercising discretion over *DVA* to offset the effect of *LLP* on earnings. The panel also reports that the mean of *ABN_DVA* is significantly lower at the 10% level when *RGL* is High than when it is Low (*t*-statistic = -1.7). This result is consistent with banks exercising discretion over *DVA* to offset the effect of *RGL* on earnings.

Panel C reports that the mean of *ABN_DVA* is significantly higher at the 10% level when *LLP_SMOOTH* is High than when it is Low (*t*-statistic = 1.7). This result indicates that banks that use LLP to smooth earnings tend to report more income increasing DVA. In contrast, the panel reports no significant difference in the mean of *ABN_DVA* when *RGL_SMOOTH* is High than when it is Low.

Insert Table 3 here

5.2 Hypothesis tests

Columns 1-3 of Table 4 report the estimations of equations (1)-(3), the models of the nondiscretionary determinants of *LLP*, *RGL*, and *DVA*, respectively. Column 4 of the table reports the estimation of an expansion of equation (3) that breaks the explanatory variable *L_CDVA* into its normal and abnormal components, i.e., *L_NOR_CDVA* and *L_ABN_CDVA*, based on the estimation of equation (4). The results in columns 3 and 4 constitute the tests of hypothesis H1 that *DVA* is negatively associated with proxies for the changes in the creditworthiness of banks that elect the FVO for liabilities.

We first discuss the results for *LLP* and *RGL*. In column 1, *LLP* is significantly positively associated with both the lagged allowance for loan losses, *L_ALW*, and the current change in non-performing loans, *ΔNPA*, consistent with prior empirical literature (e.g., Liu and Ryan 2006). The significant positive coefficient on *L_ALW* is consistent with banks that

write credit riskier loans having both higher *L_ALW* and higher *LLP*, rather than with higher *L_ALW* indicating less need for banks to record LLP in the current period. The significant positive coefficient on *ΔNPA* is consistent with banks increasing LLP as loan performance deteriorates.

In column 2, *RGL* is significantly positively associated at the 10% level with lagged cumulative unrealized net gains on AFS securities, *L_UNGL*, consistent with prior literature (e.g., Scholes et al. 1990, Beatty and Harris (1999).[19] This result indicates that banks tend to realize gains (losses) when they primarily have unrealized gains (losses) available to realize, and thus is consistent with non-discretionary realization rather than with gains trading (e.g., Ryan 2007, Dong & Zhang, 2014).

Insert Table 4 here

In column 3, *DVA* is significantly negatively associated with lagged cumulative *DVA*, *L_CDVA*, (*p-value* = 0.024), indicating mean reversion in cumulative *DVA*. Such mean reversion could occur due to non-discretionary factors such as banks taking actions to mitigate increases in their own credit risk or mean reversion in the economic conditions affecting banks. It could also reflect banks' exercise of discretion over DVA reversing over time. The latter interpretation is supported by the findings reported in column 4 that the coefficient on *L_ABN_CDVA* is significantly negative (*p-value* = 0.011) while the coefficient on *L_NOR_CDVA* is insignificant.

Returning to column 3, *DVA* is significantly negatively associated with the change in unsecured debt, *Δ_UNSECDEBT*, (*p-value* = 0.001). This result is consistent with healthier banks being better able to issue unsecured debt, rather than with a given bank's own credit

[19] We explore temporal variation in coefficient on *UNGL* by splitting the sample period into years dominated by the financial crisis and its immediate aftermath (2008-2010), when regulatory capital adequacy was more likely to be an issue for banks, versus subsequent years in which stability gradually returned (2011-2013). We find that RGL is significantly positively associated with *UNGL* only in the latter period, perhaps because banks exercised discretion to realize gains during the crisis even when their *UNGL* was low or a loss.

risk increasing with its leverage. Unsurprisingly, *DVA* is significantly positively associated the change in the bank's bond yield spread, *Δ_YIELDSPREAD*, (*p-value* = 0.007). As expected, *DVA* is significantly negatively associated with the change in the bank's average bond maturity, *Δ_MATURITY*, (p-value = 0.046).

Although the coefficients on the change in credit rating, *Δ_CREDIT*, and the change in long-term derivative liabilities, *Δ_LTDERLIAB*, are insignificant in column 3, overall the results in this column provide support for hypothesis H1 that *DVA* is negatively associated with proxies for the changes in the creditworthiness of banks that elect the FVO for liabilities.

We estimate the normal (abnormal) components of *LLP*, *RGL* and *DVA*, i.e., *NOR_LLP*, *NOR_RGL*, *NOR_DVA* (*ABN_LLP*, *ABN_RGL*, *ABN_DVA*) as the predicted values (residuals) from the estimations of equations (1)-(3), respectively.

Table 5 reports the estimation of equation (5), the model of banks smoothing their earnings by exercising discretion over *LLP*, *RGL*, and *DVA*. Column 1 of the table reports the estimation of a version of the equation that includes only banks' *LLP*, *RGL*, and *DVA*. Column 2 breaks the explanatory variable *DVA* into its normal and abnormal components, *NOR_DVA* and *ABN_DVA*, respectively, based on the estimation of equation (3). This column also includes (only) the discretionary portions of *LLP* and *RGL*, *ABN_LLP* and *ABN_RGL* based on the estimations of equations (1) and (2), respectively. The results in this table constitute the tests of hypothesis H2 that *PREMANAGED_INC* is negatively associated with *ABN_DVA*.

Insert Table 5 here

Consistent with prior research, Table 5 provides evidence that banks exercise discretion over LLP to smooth earnings. Specifically, the coefficient on *LLP* is significantly negative in column 1 and the coefficient on *ABN_LLP* is significantly negative in column 2. The table provides inconsistent evidence, however, that banks exercise discretion over RGL

to smooth earnings. Specifically, the coefficient on *RGL* is significantly positive in column 1, but the coefficient on *ABN_RGL*, while positive and large, is insignificant in column 2. The coefficient on lagged operating income, *L_OI*, is significantly positive, indicating positive autocorrelation in operating income.

In column 1, the coefficient on *DVA* is significantly negative (p-value = 0.000). In column 2, the coefficient on *ABN_DVA* is significantly negative at the 10% level (p-value = 0.079). These results are consistent with hypothesis H2 that banks exercise discretion over *DVA* to smooth earnings. Moreover, in column 2 the coefficient on *NOR_DVA* is insignificant, suggesting that normal *DVA* does not smooth earnings.

Table 6 reports the estimation of equation (6), the model of how banks' exercise of discretion over DVA to smooth earnings interacts with their levels of LLP and RGL. Column 1 of the table reports the estimation of a model that includes an interaction of *DVA* with the indicator for above-median *LLP*, *H_LLP*. Column 2 reports the estimation of a model that includes an interaction of *DVA* with the indicator for below-median *RGL*, *L_RGL*. Column 3 reports the estimation of a model that interacts normal and abnormal DVA separately with *H_LLP*. The table does not include a corresponding column that interacts normal and abnormal DVA separately with *L_RGL*, because the results in column 2 indicate no interaction exists between *DVA* and *L_RGL*. The results in all three columns test hypothesis H3 that banks' exercise of discretion over (abnormal) DVA to smooth earnings is associated with (the levels of) their LLP and RGL on AFS securities. We do not discuss the coefficients on the control variables as they are very similar to the corresponding coefficients in Table 5.

In column 1, the coefficient on *DVA* is significantly negative (-1.782, *p-value* = 0.000), as in Table 5. The coefficient on *DVA * H_LLP* is significantly positive and of similar absolute magnitude (2.179, *p-value* = 0.040), however, so that the sum of these two coefficients is insignificantly different from zero. Hence, these results indicate that banks with

low LLP use DVA to smooth earnings, whereas banks with high LLP do not. This may reflect banks with high LLP either preferring or having greater ability to manage earnings using that variable rather than using DVA.

Insert Table 6 here

In column 2, the coefficient on *DVA* is significantly negative (-1.030, *p-value* = 0.012), as in column 1. The coefficient on *DVA * L_RGL* is insignificant, however, so that the sum of these two coefficients remains significantly negative (-1.304, *p-value* = 0.000). Hence, these results indicate that banks with both low and high RGL use DVA to smooth earnings. This may reflect banks preferring or having greater ability to manage income using opaque DVA rather than transparent RGL.

In column 3, the coefficient on *NOR_DVA* is insignificant, as is the coefficient on *NOR_DVA * H_LLP*. These results indicate that banks' normal DVA does not smooth earnings. In contrast, the coefficient on *ABN_DVA is* significantly negative (-2.274, *p-value* = 0.020), indicating that abnormal DVA does smooth earnings. The coefficient on *ABN_DVA * H_LLP* is significantly positive and of similar absolute magnitude (2.871, *p-value* = 0.045), however, so that the sum of the coefficients on *ABN_DVA* and *ABN_DVA * H_LLP* is insignificantly different from zero. Hence, these results indicate that banks with low LLP exercise discretion over (abnormal) DVA to smooth earnings, whereas banks with high LLP do not. This may reflect banks with high LLP either preferring or having greater ability to manage earnings using that variable rather than using DVA.

Table 7 reports the estimation of a modified version of equation (6) that models how banks' exercise of discretion over DVA to smooth earnings interacts with their use of LLP and RGL to smooth earnings. Column 1 of the table reports the estimation of a model that includes an interaction of *DVA* with the indicator for their use of LLP to smooth earnings, *LLP_SMOOTH*. Column 2 reports the estimation of a model that includes an interaction of

DVA with the indicator for their use of RGL to smooth earnings, *RGL_SMOOTH*. Column 3 reports the estimation of a model that interacts normal and abnormal DVA separately with *LLP_SMOOTH*. The table does not include a corresponding column that interacts normal and abnormal DVA separately with *RGL_SMOOTH*, because the results in column 2 indicate no interaction exists between *DVA* and *RGL_SMOOTH*. The results in all three columns test hypothesis H3 that banks' exercise of discretion over (abnormal) DVA to smooth earnings is associated with their (use of) LLP and RGL on AFS securities (to smooth earnings). We again do not discuss the coefficients on the control variables.

In column 1, the coefficient on *DVA* is significantly negative (-3.103, *p-value* = 0.000). The coefficient on *DVA * LLP_SMOOTH* is significantly positive but only about half the absolute magnitude (1.656, *p-value* = 0.031), so that the sum of these two coefficients remains significantly negative (-1.447, *p-value* = 0.001). Hence, these results indicate that banks that do not use LLP to smooth earnings do use DVA to smooth earnings, and also that banks that use LLP to smooth earnings also use DVA to smooth earnings, just somewhat less than do the former banks. This suggests that LLP and DVA are substitutable ways for banks to smooth earnings.

Insert Table 7 here

In column 2, the coefficient on *DVA* is significantly negative (-1.242, *p-value* = 0.000). The coefficient on *DVA * RGL_SMOOTH* is insignificant, although it is sufficiently positive and/or subject to estimation error so that the sum of these two coefficients becomes insignificant. Overall, these results indicate that banks' use of RGL to smooth earnings does not affect their use of DVA to smooth earnings. This suggests that banks do not use RGL and DVA as substitutable ways to smooth earnings.

In column 3, the coefficient on *NOR_DVA* is insignificant, as is the coefficient on *NOR_DVA * LLP_SMOOTH*. These results indicate that banks' normal DVA does not

smooth earnings. In contrast, the coefficient on *ABN_DVA is* significantly negative (-4.443, *p-value* = 0.008), indicating that abnormal DVA does smooth earnings. The coefficient on *ABN_DVA * LLP_SMOOTH* is significantly positive and of similar absolute magnitude (4.816, *p-value* = 0.012), however, so that the sum of the coefficients on *ABN_DVA* and *ABN_DVA * LLP_SMOOTH* is insignificantly different from zero. Hence, these results indicate that banks that do not use LLP to smooth earnings exercise discretion over (abnormal) DVA to smooth earnings, whereas banks that use LLP to smooth earnings do not exercise discretion over (abnormal) DVA to smooth earnings. This may reflect banks that use LLP to smooth earnings either preferring or having greater ability to manage earnings using that variable rather than using DVA.

As discussed in the introduction, financial analysts were particularly concerned with banks' use of DVA to meet earnings targets during the financial crisis. To provide evidence regarding that concern, Table 8 reports the estimation of an expanded version of the model reported in column 2 of Table 5 that interacts *NOR_DVA* and *ABN_DVA* with the indicator *CRISIS* which takes a value of one for the years in our sample during the financial crisis and its immediate aftermath, 2008-2010, and zero for the subsequent years, 2011-2013. The table reports that coefficient on *ABN_DVA* is significantly negative during the crisis period (-1.566, *p-value* = 0.007) but insignificant in the subsequent period. Hence, banks' exercise of discretion over DVA to smooth earnings appears limited to the crisis and its immediate aftermath. In contrast, the coefficient on *NOR_DVA* is insignificant in both the crisis and subsequent periods, again suggesting that normal *DVA* does not smooth earnings.

Insert Table 8 here

7. Conclusion

In this paper, for European listed banks in the years 2008-2013, we empirically examine the banks' recorded unrealized gains and losses on financial liabilities recognized at

fair value under IAS 39's fair value option (FVO) that are attributable to the changes in the banks' own credit risk during the year. These gains and losses commonly are referred to as the debt (or debit) valuation adjustment (DVA). Various parties have criticized the accounting recognition of DVA for at least three reasons. First, DVA is "counterintuitive", because firms record gains (losses) in periods that their own creditworthiness decreases (increases). Second, firms have limited ability to realize DVA, due to restrictions on transfer of liabilities and because distressed firms with gains typically do not have the resources to buy back liabilities. Third, firms have considerable discretion over the estimation of DVA for financial liabilities that do not trade in liquid markets.

In this study, we provide the first evidence that banks exercise discretion over DVA to satisfy earnings management objectives, in particular, to smooth earnings. Building on prior accounting research showing that banks exercise discretion over loan loss provisions (LLP) and realized gains and losses on available-for-sale securities (RGL) to smooth earnings, we conduct empirical analyses that control for LLP and RGL and that interact DVA with proxies for how banks use LLP and RGL to manage earnings. We conduct three analyses. First, we specify and estimate models of the non-discretionary and discretionary determinants of banks' DVA, LLP, and RGL. Second, we test the hypothesis that banks exercise discretion over DVA to smooth earnings. We conduct this test by regressing pre-managed earnings, defined as operating income before DVA, on banks' abnormal DVA, controlling for abnormal LLP and RGL. Third, we test whether banks' exercise of discretion over DVA, LLP, and RGL depends on proxies for their prior use of these variables to manage earnings. In this analysis, to capture financial analysts' concerns that banks used DVA to meet earnings targets during the financial crisis, we subdivide the sample into the financial crisis including its immediate aftermath (2008-2010) and the subsequent recovery (2011-2013).

In the first analysis, we find that DVA is negatively associated with the cumulative DVA at the beginning of the year, positively associated with the change in the bank's bond spread during the year, and negatively associated with the changes in banks' unsecured debt and average remaining bond maturity during the year. These findings are consistent with less creditworthy firms generating more earnings-increasing DVA. In the second analysis, we find that abnormal DVA is negatively associated with pre-managed earnings, consistent with banks exercising discretion over DVA to smooth earnings. In the third analysis, we find that banks with high LLP or that aggressively smooth earnings using LLP exercise less discretion over DVA to smooth earnings, consistent with LLP and DVA being substitutable ways to smooth earnings. In contrast, we do not find a significant interaction between DVA and RGL.

To the best of our knowledge, our paper makes two primary contributions to the literature on fair value accounting and bank financial reporting. First, our paper is the first to document that banks use DVA to smooth earnings. Second, our paper is the first to examine interactions among three significant discretionary accounting variables for banks: LLP, RGL and DVA. We find that abnormal DVA and abnormal LLP are substitutable ways that banks smooth earnings. Future researchers could conduct similar analyses on US banks electing the fair value option for financial liabilities under FAS 159.

Our results have significant and timely implications for accounting standard setters, bank regulators, and other users of financial reports. In July 2014, IASB revised IFRS 9, *Financial Instruments*, and in February 2016, the FASB issued Accounting Standards Update (ASU) 2016-1, *Recognition and Measurement of Financial Assets and Financial Liabilities*, both of which require that changes in the fair value of financial liabilities attributable to the reporting firm's own credit risk be recorded in other comprehensive income, rather than in net income. Our findings that banks use DVA to manage earnings provide support for these

revisions, as well as for Basel III rules that remove DVA from the calculation of the regulatory capital ratios.

Appendix 1: Sample disclosures of periodic and/or cumulative DVA amounts in banks' interim and annual reports

Example 1: Tabular disclosure of periodic and cumulative DVA amounts

Source: UBS, third quarter Report 2013, page 116

Own credit on financial liabilities designated at fair value

	As of or for the quarter ended			Year-to-date	
CHF million	**30.9.13**	30.6.13	30.9.12	30.9.13	30.9.1
Gain/(loss) for the period ended	**(147)**	138	(863)	(189)	(1,78)
Life-to-date gain/(loss)	**(482)**	(339)	132		

Example 2: Textual disclosure of both periodic and cumulative DVA amounts

Source: ESPIRITO SANTO Financial Group, Consolidated financial statements as at 31 December 2012, page 73

"As at 31 December 2012, the fair value of the financial liabilities at fair value through profit or loss includes a positive cumulative effect of euro 167.1 million (31 December 2011: positive cumulative effect of euro 202.3 million) attributable to the Group's own credit risk. The change in fair value attributable to the Group's own credit risk resulted in the recognition, in 2012, of a loss amounting to euro 35.2 million (31 December 2011: profit of euro 50.9 million)".

Example 3: Tabular disclosure of the removal of cumulative DVA amounts from reported shareholders' equity to obtain Tier-1 capital

Source: Swedbank Annual Report 2012, page 109

Capital ratios according to Basel 2	2012	2011
Shareholders' equity according to the Group balance sheet*	106 070	97 993
Non-controlling interests	154	140
Anticipated dividend	–10 880	–5 825
Deconsolidation of insurance companies	–2 444	–1 980
Associated companies consolidated according to purchase method	1 978	1 742
Unrealized value changes in financial liabilities due to changes in own creditworthiness	92	–23
Cash flow hedges	42	–268
Goodwill	–10 894	–11 085
Deferred tax assets	–567	–843
Intangible assets	–1 880	–1 767
Net provisions for reported iRb credit exposures	–938	–748
Shares deducted from Tier 1 capital	–36	–34
Total Common Equity Tier 1 capital	**80 697**	**77 302**

Example 4: Tabular disclosure of the removal of cumulative DVA amounts from reported shareholders' equity to obtain Tier-1 capital, distinguishing the composition of and types of adjustments to regulatory capital

Source: HSBC – Interim Report 2013, page 186

Capital structure

Composition of regulatory capital

	At 30 June 2013 US$m	At 30 June 2012 US$m	At 31 December 2012 US$m
Shareholders' equity	**165,816**	160,606	167,360
– shareholders' equity per balance sheet[5]	**174,070**	165,845	175,242
– preference share premium	**(1,405)**	(1,405)	(1,405)
– other equity instruments	**(5,851)**	(5,851)	(5,851)
– deconsolidation of special purpose entities[6]	**(998)**	2,017	(626)
Non-controlling interests	**4,754**	4,451	4,348
– non-controlling interests per balance sheet	**8,291**	7,921	7,887
– preference share non-controlling interests	**(2,395)**	(2,412)	(2,428)
– non-controlling interests transferred to tier 2 capital	**(490)**	(496)	(501)
– non-controlling interests in deconsolidated subsidiaries	**(652)**	(562)	(610)
Regulatory adjustments to the accounting basis	**178**	(3,308)	(2,437)
– unrealized losses on available-for-sale debt securities[7]	**2,354**	1,208	1,223
– own credit spread	**137**	(2,115)	112
– defined benefit pension fund adjustment[8]	**70**	(116)	(469)
– reserves arising from revaluation of property and unrealized gains on available-for-sale equities	**(2,567)**	(2,387)	(3,290)
– cash flow hedging reserve	**184**	102	(13)
Deductions	**(29,858)**	(31,080)	(30,482)
– goodwill capitalized and intangible assets	**(24,994)**	(26,650)	(25,733)
– 50% of securitization positions	**(1,772)**	(1,364)	(1,776)
– 50% of tax credit adjustment for expected losses	**134**	145	111
– 50% of excess of expected losses over impairment allowances	**(3,276)**	(3,211)	(3,084)
Core tier 1 capital	**140,890**	130,669	138,789

Example 5: Tabular disclosure of the removal of cumulative DVA amounts from reported shareholders' equity to obtain internal capital adequacy ratio

Source: DEUTSCHE BANK annual report 2014, page 256

Internal Capital Adequacy

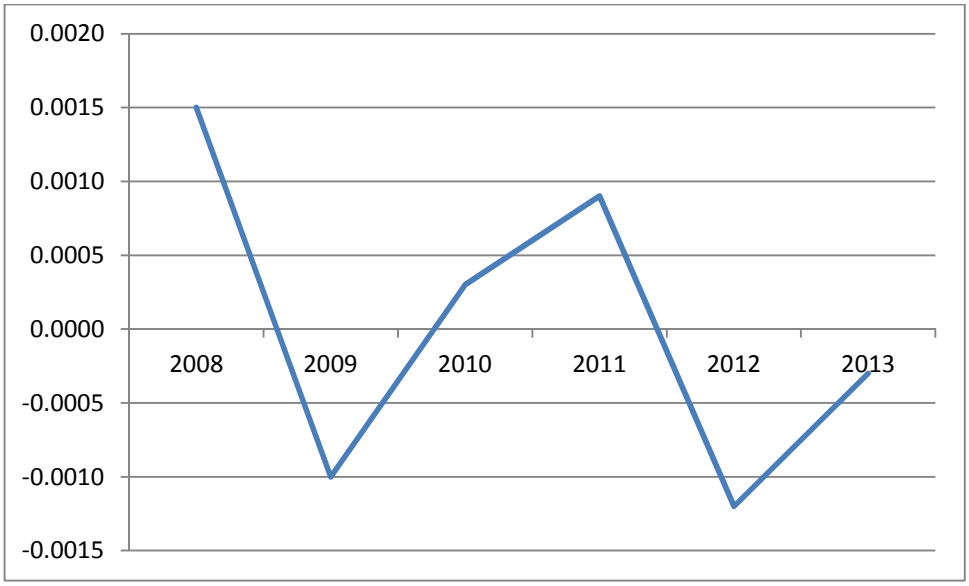
in € m.
(unless stated otherwise)

	Dec 31, 2014	Dec 31, 2013
Capital supply		
Shareholders' equity	68,351	54,719
Fair value gains on own debt and debt valuation adjustments, subject to own credit risk[1]	(544)	(537)
Defined benefit pension fund assets[2]	(961)	(639)
Deferred tax assets	(6,865)	(7,071)
Fair Value adjustments for financial assets reclassified to loans[3]	0	(363)
Non-controlling Interests[4]	0	0
Hybrid Tier 1 capital instruments	16,158	12,182
Tier 2 capital instruments	6,620	9,689
Capital supply	**82,759**	67,980
Capital demand		
Economic capital requirement	31,866	27,171
Intangible assets	14,951	13,932
Capital demand	**46,817**	41,103
Internal capital adequacy ratio	**177 %**	165 %

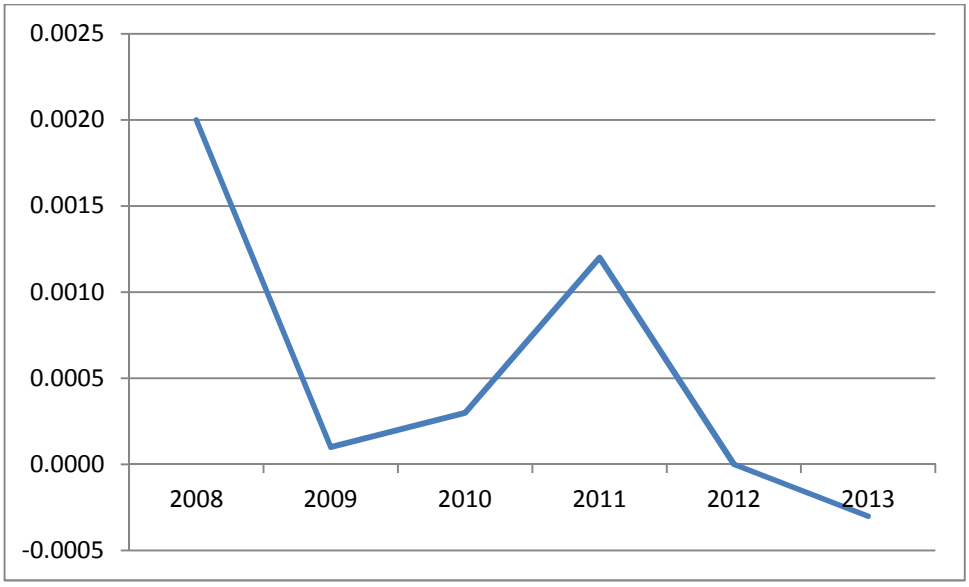
[1] Includes deduction of fair value gains on own credit-effect relating to own liabilities designated under the fair value option as well as the debt valuation adjustments.

Figure 1: Average DVA and Cumulative DVA by Year

Panel A: Average DVA by Year



Panel B: Cumulative DVA by Year



Panel C: Number of Banks Reporting Positive and Negative DVA by Year

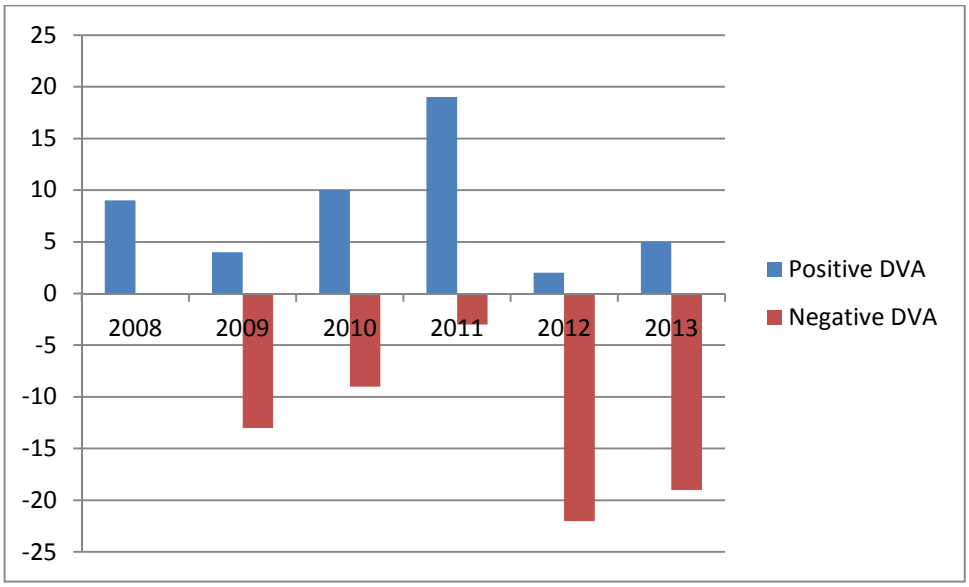
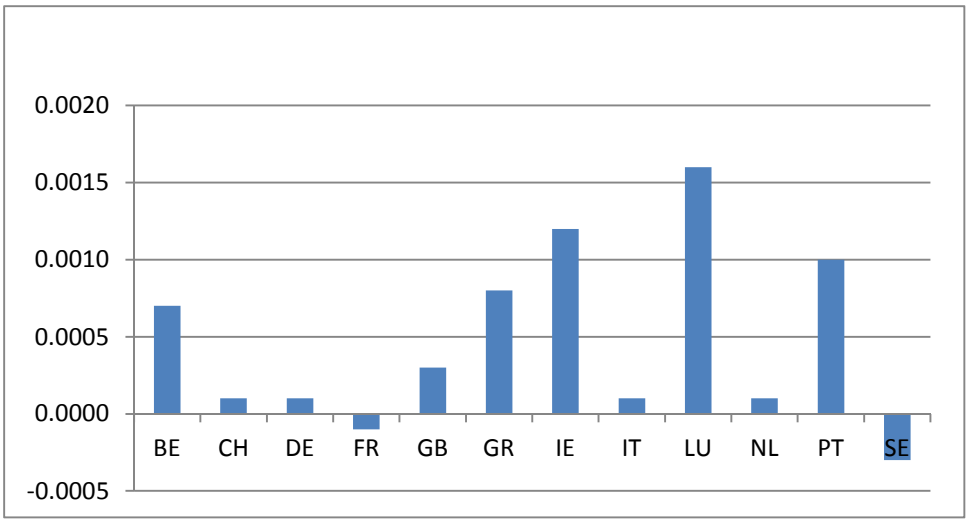
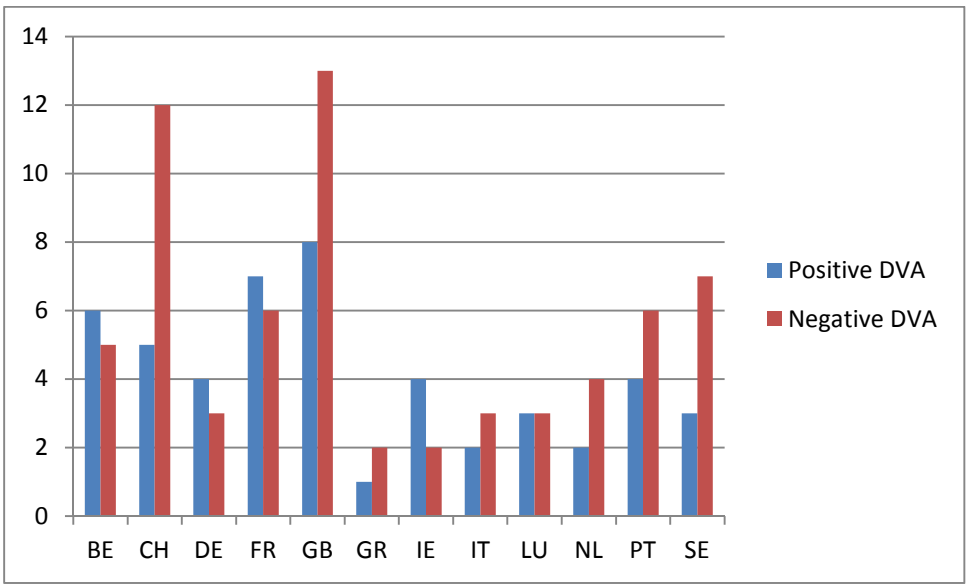


Figure 2: Average DVA and Number of Positive and Negative DVA Reporting Banks by Country

Panel A: Average DVA by Country



Panel B: Number of Banks Reporting Positive and Negative Average DVA by Country



Note: Country acronyms: BE-Belgium, CH-Switzerland, DE-Denmark, FR-France, GB-United Kingdom, GR-Greece, IE-Ireland, IT-Italy, LU-Luxembourg, NL-Netherlands, PT-Portugal and SE-Sweden.

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Table 1- Number of non-zero DVA-reporting bank-years by country and year

	2008	2009	2010	2011	2012	2013	**No. by country**
Country							
Belgium	1	2	2	2	2	2	**11**
Denmark	1	1	1	2	2	2	**9**
France	1	2	2	2	3	3	**13**
Greece	0	0	0	1	1	1	**3**
Ireland	1	1	1	1	1	1	**6**
Italy	0	1	1	1	1	1	**5**
Luxembourg	1	1	1	1	1	1	**6**
Netherlands	1	1	1	1	1	1	**6**
Portugal	0	2	2	2	2	2	**10**
Sweden	0	1	2	2	3	3	**11**
Switzerland	2	3	3	3	3	3	**17**
UK	1	3	4	4	4	5	**21**
No. by year	**9**	**18**	**20**	**22**	**24**	**25**	**118**

Note: A non-zero DVA-reporting bank-year is defined as a year in which a bank reports both DVA and cumulative DVA and the DVA amount is non-zero.

Table 2 - Descriptive statistics

	n	Mean	Std. Dev.	Min	Median	Max
PREMANAGED_INC	111	0.0023	0.0064	-0.0192	0.0031	0.0170
DVA	111	-0.0001	0.0009	-0.0036	0.0000	0.0023
L_CDVA	111	0.0002	0.0011	-0.0050	0.0000	0.0036
L_ABN_CDVA	111	0.0000	0.0010	-0.0047	0.0001	0.0022
L_NOR_CDVA	111	0.0001	0.0007	-0.0010	0.0000	0.0024
Δ_CREDIT	111	-0.0247	0.0709	-0.4375	0.0000	0.3000
Δ_UNSECDEBT	111	-0.0101	0.0647	-0.2697	-0.0088	0.2296
Δ_LTDERLIAB	111	-0.0054	0.0399	-0.1159	-0.0011	0.1010
Δ_YIELDSPREAD	111	0.0017	0.0242	-0.0531	-0.0022	0.0778
Δ_MATURITY	111	-1.0376	1.7216	-8.1562	-1.0000	3.6117
LLP	98	0.0089	0.0085	-0.0004	0.0071	0.0608
RGL	98	0.0007	0.0014	-0.0034	0.0004	0.0075
H_LLP	98	0.4694	0.5016	0.0000	0.0000	1.0000
L_RGL	98	0.5521	0.4999	0.0000	1.0000	1.0000
LLP_SMOOTH	98	0.7245	0.4491	0.0000	1.0000	1.0000
RGL_SMOOTH	98	0.6939	0.4633	0.0000	1.0000	1.0000
OI	98	0.0024	0.0058	-0.0183	0.0039	0.0192
BTM	98	0.8099	0.4493	0.0000	0.7400	2.7200
ABN_DVA	66	-0.0001	0.0008	-0.0032	0.0000	0.0018
NOR_DVA	66	-0.0002	0.0007	-0.0019	-0.0002	0.0014
ABN_LLP	66	0.0006	0.0083	-0.0176	-0.0003	0.0618
ABN_RGL	66	-0.0001	0.0014	-0.0039	-0.0001	0.0063

Variable definitions:
PREMANAGED_INC: operating income before the pretax debt valuation adjustment (DVA) divided by beginning-of-year total assets; *DVA*: pretax DVA divided by beginning-of-year total assets; *L_CDVA*: beginning-of-year cumulative pretax DVA divided by beginning-of-year total assets; *L_ABN_CDVA*: abnormal cumulative DVA estimated as the residual from model (3); *L_NOR_CDVA*: normal cumulative DVA estimated as the fitted value from model (3); *Δ_CREDIT*: percentage change in numeric credit rating during the year; *ΔUNSECDEBT*: change in unsecured debt divided by beginning-of-year total assets; *ΔLTDERLIAB*: change of non-current derivative liabilities divided by beginning-of-year total assets; *ΔYIELDSPREAD*: change in bonds yield spread; *ΔDEFAULT*: change in market default life; *LLP*: loan loss provision as a percentage of the beginning total loans; *RGL*: realized security gains and losses divided by beginning-of-year total assets; *H_LLP*: indicator variable equal one for above median LLP values, zero otherwise; *L_RGL*: indicator variable equal one for below median RGL values, zero otherwise; *LLP_SMOOTH*: indicator variable equal one for banks that have a positive firm-specific coefficient of change in earnings before LLP regressed on the change in LLP, zero otherwise; *RGL_SMOOTH*: indicator variable equal one for banks that have a negative firm-specific coefficient of change in earnings before RGL regressed on the change in RGL, zero otherwise; *OI*: operating income divided by beginning-of-year total assets; *BTM*: Book value of owners' equity divided by market value of owners' equity; *ABN_DVA*: abnormal periodic DVA estimated as the residual from model (4); *NOR_DVA*: normal periodic DVA estimated as the fitted value from model (4); *ABN_LLP*: abnormal loan loss provision (LLP) estimated as the residual from model (1); *ABN_RGL*: abnormal realized securities gains or losses (RGL) estimated as the residual from model (2).

Table 3 – Tests of differences of the means of DVA across sample partitions

Panel A

t-tests of differences in the means of DVA for High versus Low *PREMANAGED_INC*

		DVA	***t*-stat**	***ABN_DVA***	***t*-stat**
PREMANAGED_INC	High	-0.0010	**-0.0011**	-0.0005	**-0.0005**
	Low	0.0000	**(-2.474)****	0.0001	**(-1.787)***

Panel B

t-tests of differences in the means of *DVA* for high versus low *LLP* or *RGL*

		DVA	***t*-stat**	**ABN_DVA**	***t*-stat**
LLP	High	0.0001	**0.0006**	0.0001	**0.0003**
	Low	-0.0005	**(1.833)***	-0.0002	**(1.795)***
RGL	High	-0.0003	**-0.0002**	-0.0002	**-0.0003**
	Low	-0.0001	**(-0.765)**	0.0001	**(-1.679)***

Panel C

t-tests of differences in the means of *DVA* for high versus low *LLP_SMOOTH* or *RGL_SMOOTH*

		DVA	***t*-stat**	**ABN_DVA**	***t*-stat**
LLP_SMOOTH	Yes	-0.0002	**0.0001**	0.0001	**0.0005**
	No	-0.0003	**(0.375)**	-0.0004	**(1.714)***
RGL_SMOOTH	Yes	-0.0001	**0.0004**	-0.0000	**-0.0001**
	No	-0.0005	**(0.913)**	0.0001	**(-0.549)**

Note: Panel A (B) [C] presents tests of the differences of the means of DVA and abnormal DVA for groups formed based on High versus Low *PREMANAGED_INC* (*LLP* or *RGL*) [*LLP_SMOOTH* or *RGL_SMOOTH*]. A firm-year observation of a given partitioning variable is classified as High (Low) if the value of the variable is above (below) its pooled sample median. All variables are defined in the notes to Table 2. The *t*-stat column reports the mean for the High group minus the mean for the Low group and the *t*-statistic in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

Table 4 - Determinants of (normal) DVA

Dependent Variables	LLP	RGL	DVA	DVA
Model	(1)	(2)	(3)	(4)
L_ALW	0.182***			
	(0.000)			
L_NPA	0.013			
	(0.325)			
Δ_NPA	0.152***			
	(0.000)			
LN_TA		-0.000		
		(0.155)		
L_UNGL		0.092*		
		(0.070)		
L_CDVA			-0.238**	
			(0.024)	
L_ABN_CDVA				-0.319**
				(0.011)
L_NOR_CDVA				-0.045
				(0.676)
Δ_CREDIT			-0.001	-0.001
			(0.190)	(0.294)
Δ_UNSECDEBT			-0.003***	-0.003***
			(0.001)	(0.002)
Δ_LTDERLIAB			0.003	0.003
			(0.249)	(0.157)
Δ_YIELDSPREAD			0.008***	0.010***
			(0.007)	(0.000)
Δ_MATURITY			-0.000**	-0.000
			(0.046)	(0.160)
Constant	0.002**	0.002	-0.001	-0.001
	(0.030)	(0.194)	(0.178)	(0.169)
Observations	705	742	111	111
R-squared	0.365	0.144	0.420	0.438
Year FE	YES	YES	YES	YES
L_ABN_CDVA = L_NOR_CDVA				0.027**

Note: This table presents the estimations of equations (1)-(3) of the determinants of (normal) LLP, RGL and *DVA*, respectively. We estimate each of these models on the pooled sample of all bank-year observations with non-missing data on the included variables. All models include year fixed effects. Model (4) is an expansion of equation (3) that distinguishes normal versus abnormal lagged cumulative DVA based on the estimation of equation (4); *L_NOR_CDVA* is the predicted value and *L_ABN_CDVA* is the residual from this estimation. All variables are defined in the notes to Table 2. ***, **, * represent 1%, 5%, and 10% significance, respectively.

Table 5 – Banks' earnings smoothing using (abnormal) DVA

Dependent Variable	PREMANAGED_INC	
Model	(1)	(2)
DVA	-1.347***	
	(0.000)	
ABN_DVA		-1.194*
		(0.079)
NOR_DVA		-0.386
		(0.842)
ABN_LLP		-0.394***
		(0.000)
ABN_RGL		0.639
		(0.199)
LLP	-0.478***	
	(0.000)	
RGL	0.829**	
	(0.014)	
L_OI	0.330***	0.539***
	(0.004)	(0.002)
L_BTM	0.001	0.002
	(0.541)	(0.306)
Constant	0.006***	0.000
	(0.001)	(0.911)
Observations	89	66
R-squared	0.729	0.562
Year FE	YES	YES

Note: This table presents the estimations of equation (5) of the banks' use of DVA to smooth earnings. We estimate each of these models on the pooled sample of all bank-year observations with non-missing data on the included variables. Model (1) is a nested version of equation (5) that does not distinguish normal versus abnormal DVA. Model (2) is equation (5) or, equivalently, an expansion of model (1) that distinguishes normal versus abnormal DVA based on the estimation of equation (3); *NOR_DVA* is the predicted value and *ABN_DVA* is the residual from this estimation. All variables are defined in the notes to Table 2. ***, **, * represent 1%, 5%, and 10% significance, respectively.

Table 6 – Effects of levels of LLP and RGL on banks' earnings smoothing using (abnormal) DVA

Dependent Variable	PREMANAGED_INC		
Model	(1)	(2)	(3)
DVA	-1.782***	-1.030**	
	(0.000)	(0.012)	
NOR_DVA			-3.243
			(0.166)
ABN_DVA			-2.274**
			(0.020)
H_LLP	-0.003**		-0.004***
	(0.011)		(0.006)
DVA * H_LLP	2.179**		
	(0.040)		
L_RGL		-0.001	
		(0.281)	
DVA * L_RGL		-0.274	
		(0.513)	
NOR_DVA * H_LLP			1.545
			(0.471)
ABN_DVA * H_LLP			2.871**
			(0.045)
LLP		-0.467***	
		(0.000)	
RGL	0.977**		1.041*
	(0.015)		(0.068)
L_OI	0.377**	0.369***	0.358**
	(0.011)	(0.001)	(0.039)
L_BTM	0.002	0.000	0.001
	(0.343)	(0.688)	(0.429)
Constant	0.001	0.007***	-0.002
	(0.753)	(0.001)	(0.675)
Observations	89	96	66
R-squared	0.488	0.702	0.469
Year FE	YES	YES	YES
DVA + DVA * H_LLP = 0	0.703		
DVA + DVA * L_RGL = 0		5.12e-05	
ABN_DVA + ABN_DVA * H_LLP = 0			0.591

Note: This table presents the estimations of equation (6) of the effect of the levels of banks' LLP and RGL on their use of DVA to smooth earnings. We estimate each of these models on the pooled sample of all bank-year observations with non-missing data on the included variables. Model (1) is a nested version of equation (6) that does not distinguish normal versus abnormal DVA and that only interacts *DVA* with the indicator for above median *LLP*, *H_LLP*. Model (2) is a nested version of equation (6) that does not distinguish normal versus abnormal DVA and that only interacts *DVA* with the indicator for below-median *RGL*, *L_RGL*. Model (3) is equation (6) or, equivalently, an expansion of model (1) that distinguishes normal versus abnormal DVA based on the estimation of equation (3); *NOR_DVA* is the predicted value and *ABN_DVA* is the residual from this estimation. All variables are defined in the notes to Table 2. ***, **, * represent 1%, 5%, and 10% significance, respectively.

Table 7 – Effects of earnings smoothing using LLP and RGL on banks' earnings smoothing using (abnormal) DVA

Dependent Variable	PREMANAGED_INC		
Model	(1)	(2)	(3)
DVA	-3.103***	-1.242***	
	(0.000)	(0.000)	
NOR_DVA			-4.819
			(0.174)
ABN_DVA			-4.443***
			(0.008)
LLP_SMOOTH	0.000		-0.000
	(0.890)		(0.993)
RGL_SMOOTH		-0.000	
		(0.865)	
DVA * LLP_SMOOTH	1.656**		
	(0.031)		
DVA * RGL_SMOOTH		0.369	
		(0.470)	
NOR_DVA * LLP_SMOOTH			2.041
			(0.436)
ABN_DVA * LLP_SMOOTH			4.816**
			(0.012)
LLP		-0.470***	
		(0.000)	
RGL	0.792*		0.783
	(0.054)		(0.174)
L_OI	0.514***	0.375***	0.506***
	(0.001)	(0.000)	(0.007)
L_BTM	0.002	0.000	0.002
	(0.336)	(0.812)	(0.403)
Constant	-0.003	0.007***	-0.008
	-0.328	(0.000)	(0.200)
Observations	89	98	66
R-squared	0.424	0.699	0.422
Year FE	YES	YES	YES
DVA + DVA * LLP_SMOOTH = 0	0.001***		
DVA + DVA * RGL_SMOOTH = 0		0.132	
NOR_DVA + NOR_DVA * LLP_SMOOTH = 0			0.298
ABN_DVA + ABN_DVA * LLP_SMOOTH = 0			0.618

Note: This table presents the estimations of a modified version of equation (6) that models the effect of the banks' use of LLP and RGL to smooth earnings on their use of DVA to smooth earnings. We estimate each of these models on the pooled sample of all bank-year observations with non-missing data on the included variables. Model (1) is a nested version of the modified version of equation (6) that does not distinguish normal versus abnormal DVA and that only interacts *DVA* with the indicator for banks that smooth earnings using *LLP*, *LLP_SMOOTH*. Model (2) is a nested version of the modified version of equation (6) that does not distinguish normal versus abnormal DVA and that only interacts *DVA* with the indicator for banks that smooth earnings using RGL, *RGL_SMOOTH*. Model (3) is the modified version of equation (6) or, equivalently, an expansion of model (1) that distinguishes normal versus abnormal DVA based on the estimation of equation (3); *NOR_DVA* is the predicted value and *ABN_DVA* is the residual from this estimation. All variables are defined in the notes to Table 2. ***, **, * represent 1%, 5%, and 10% significance, respectively.

Table 8 – Earnings smoothing using DVA during and after the financial crisis

Dependent Variable	
NOR_DVA	-0.738
	(0.332)
NOR_DVA * CRISIS	-0.672
	(0.658)
ABN_DVA	0.002
	(0.997)
ABN_DVA * CRISIS	-1.568**
	(0.033)
CRISIS	0.003***
	(0.003)
LLP	-0.484***
	(0.000)
RGL	0.685*
	(0.084)
L_OI	0.322***
	(0.009)
L_BTM	0.001
	(0.537)
Constant	0.004***
	(0.000)
Observations	66
R-squared	0.769
ABN_DVA + ABN_DVA * CRISIS = 0	0.007***
NOR_DVA + NOR_DVA * CRISIS = 0	0.266

Note: This table presents the estimations of an expansion of the model in column 2 of Table 5 that interacts normal and abnormal DVA with an indicator variable CRISIS that takes a value of one for the sample years during the financial crisis and its immediate aftermath, 2008-2010, and zero in the subsequent years, 2011-2013. We estimate the model on the pooled sample of all bank-year observations with non-missing data on the included variables. All other variables are defined in the notes to Table 2. ***, **, * represent 1%, 5%, and 10% significance, respectively.