Predictability in the cross-section of European bank stock returns

Wolfgang Bessler (University of Giessen), Wolfgang Drobetz (University of Hamburg),

Thomas Erdmann (Credit Suisse), Heinz Zimmermann (University of Basel)

Universität Hamburg

Motivation of the paper

- Financial institutions were generally excluded from asset pricing tests because of their **high leverage** and the **high level of regulation** due to negative externalities that might arise from potential bank difficulties.
- Previous studies examine the influence of the macroeconomic environment on banks' operations and performance but neglect bank-specific variables.
  - In bank-based financial systems, important links might exist between bank-specific attributes and the cross-section of bank stock returns.
  - The last decade covers a significant transition period in the European banking industry, characterized by a strong increase in competition, lower margins in the traditional interest-related banking business, and increasing non-interest income in terms of fees and commissions.
- In this paper, we estimate the impact of fundamental bank-specific variables from traditional and non-traditional financial intermediation activities on bank profitability, as measured by stock returns subsequent to the release of accounting figures.
- We document that the valuation of bank stocks incorporates both the classical loan-related side of banking activities and the growing off-balance sheet activities.

Related literature

- Using a large sample of US banks from 1986 to 1999, Cooper et al. (2003) observe that the changes in the share of non-interest income and the changes in financial leverage are predictors for the cross-section of bank of stock returns.
- An interesting question is whether their results obtained for the US stock market can be generalized to European stock markets.
- Leledakis and Staikouras (2004) look at a smaller panel of European banks from 1997 to 2004, but their results indicate that only the book to market ratio and the loan quality are important in explaining the cross-section of bank stock returns.
- Our tests use a comprehensive and survivorship bias-free sample of European banks from 1991 to 2005. In contrast to the results in Leledakis and Staikouras (2004), we are able to identify a large set of fundamental variables that possess explanatory power for the cross-section of European bank stock returns.
- Barber and Lyon (1997) confirm that the standard fundamental factors retain their explanatory power in a banking context. Their significance, however, is not strongly pronounced in our sample.

Sample description (1)

- Institutions included in the sample cover a broad spectrum of activities, omitting a sample selection bias. The general functional split of banks is:

Retail banking	Corporate banking	Investment banking	Asset Mgt.	Wealth Mgt.

- Split of "**Banks**" sample according to the Industry Classification Benchmark (ICB):

Type (included)	**Description**	**Examples**
Commercial	"Classical" bank	Commerzbank, Unicredito
Bank holdings	Conglomerates	Royal Bank of Scotland, Credit Suisse
Real Estate / mortgage	Construction financing	Eurohypo
Medium / long term credit	Specialized lending	Mediobanca
Savings	Focus on retail	Sparkassen (GER), Sparenbanken (NOR)
Cooperative	Member owned	Credit Agricole (FRA), Banca Populare (IT)
Gov. credit institutions	Government influence	Kantonalbanken (SWI)
Type (not included):		
Investment / security houses	Asset Mgt. / Investment B.	Bank Privee Rothschild, Aberdeen AM

Sample description (2)

- Our sample contains yearly consolidated accounting data for a comprehensive sample of European banks from the financial statements contained in the **Bankscope database** over the time period from 1991 to 2005.
- To be included in our sample, banks must be contained in the Bankscope database with location in one of the 15 European countries forming the pre-2004 European Union, Switzerland or Norway.
- Moreover, banks are required to be **listed on a stock exchange** or to have been delisted at some point in time during the sample period from 1991 to 2005. Accordingly, our sample is free from any survivorship biases. These steps result in a reduced sample of 300 banks.
- In an additional step, the sample has been cleaned by applying the **Bankscope independence index** in combination with the Datastream item for the percentage of **free float**. Banks with a single shareholder owning more than 50% of the outstanding shares and/or a free-float below 10% during the 2002-2005 period were dropped from the sample, reducing our initial sample from 300 to 265 banks.

Sample description (3)

- The accounting data have been **cleaned for obvious outliers** and data irregularities:
  - In a first step, all observations have been removed where negative values for data items are not sensible (e.g., common equity) or where items exceed logical bounds (e.g., if loans exceed total assets).
  - In the second step, all obvious outliers in the accounting ratios have been deleted (e.g., limiting the ratio of non-interest income to total income to fall into the range between 0 and 1).
- To capture sufficient time series information, we further require that a bank has been in existence for at least 4 years.
- Our final sample contains **235 banks over the period from 1991 to 2005**, with an average of 8 years of data per entity.
- By conditioning bank stock returns over 3 months on prior (yearly) accounting data, the final **unbalanced panel contains over 6000 firm-month observations**.

The European banking universe

Country	Total assets	Equity	Net Income	Market Cap.
United Kingdom	21.2%	25.1%	26.5%	30.0%
Germany	16.2%	9.1%	2.1%	6.4%
France	14.9%	13.2%	12.2%	9.8%
Switzerland	10.1%	9.0%	18.7%	8.5%
Italy	8.3%	11.9%	7.0%	10.6%
Belgium	7.1%	5.9%	5.8%	5.0%
Spain	5.4%	7.7%	6.5%	9.5%
Netherlands	3.7%	5.5%	7.8%	6.2%
Sweden	3.2%	2.8%	3.4%	3.7%
Ireland	2.4%	2.0%	2.5%	2.5%
Austria	2.0%	2.0%	1.5%	1.6%
Denmark	1.7%	1.3%	1.6%	1.5%
Greece	1.1%	1.3%	1.1%	2.1%
Portugal	0.9%	1.2%	0.9%	0.9%
Luxembourg	0.8%	0.8%	0.6%	0.3%
Norway	0.8%	0.9%	1.4%	0.9%
Finland	0.3%	0.4%	0.7%	0.5%
Total	100.0%	100.0%	100.0%	100.0%

Measuring and timing of bank performance

- We investigate the role of bank-specific fundamental accounting variables in explaining the **cross-section of expected bank stock returns** in Europe.
- As the dependent variable, we use total monthly bank stock returns in excess of the risk free interest rate in our regressions. The risk free interest rate is proxied by the one-month Euro Interbank Offered Rate (EURIBOR).
- Monthly stock returns are related to yearly accounting data using various panel methodologies:
  - In our **main model (M3)**, we condition the monthly returns from April to June of year t+1 on annual report data from the previous year t. The lag of three months is chosen to avoid a possible look-ahead bias by ensuring that accounting information is publicly known.
  - In robustness tests, we also explore two alternative setups, using return data from April until September (M6) and December (M9), respectively.
  - Any model with monthly return data on the left hand side and yearly accounting data on the right hand side requires **correcting for potential biases** that result from the persistence of the explanatory variables combined with a potential serial correlation of the dependent variable and/or the residuals.

Fundamental variables (1)

- We construct seven **bank-specific variables** that contain fundamental (and supposedly value relevant) information:

  (1) book value of equity to total assets (EQ_TA)

  (2) loans to total assets (L_TA)

  (3) total earning assets to total non-earning assets (E_NEA)

  (4) loan loss provisions to net interest revenue (LLP_IR)

  (5) nominal value of off-balance sheet items to total assets (OB_TA)

  (6) non-interest income to total operating income (NI_TI)

  (7) cost to income ratio (CIR)

- In addition to these bank-specific variables, we add three **control variables** which have been used in previous asset pricing tests: (8) price-earnings ratio (PE), (9) book value of equity to market value of equity (BM), and (10) market capitalization (MCAP).

Fundamental variables (2)

- **EQ_TA:** Ratio of book value of common equity to total assets
  - The ratio of book value of common equity to total assets measures the capital strength and captures the general safety and soundness of the bank.
  - An increase in debt financing of the bank's total assets (holding total assets constant) and/or a decline in its total assets (holding debt financing constant) will lead to a deterioration of the bank's equity-to-assets ratio. In both cases, the bank's financing risk increases, presumably implying higher expected stock returns.
  - Literature: Brewer et al. (1996), Cantor and Johnson (1992), Sironi (1999), Di Patti (2006).
- **L_TA**: Ratio of net loans to total assets
  - Loans represent the major portion of the asset side of a bank's balance sheet. The ratio of loans to total assets proxies for the utilization of a bank's balance sheet and may be an indicator for more or less profitable business models.
  - Problem: Shareholders' bank claims are unlikely to fully reflect the information impounded in the bank's loan portfolio due to confidentiality of the bank-borrower relationship and limited disclosure about lending agreements.
  - Literature: Diamond (1984, 1991), Fama (1985), O'Hara (1993), Slovin et al. (1992).

Fundamental variables (3)

- **E_NEA:** Ratio of total earning assets to total non-earning assets
  - In addition to loans, earning assets include the various deposits due from other banks, discounts, as well as bond and equity securities held by the bank. Non-earning assets include required reserves held on deposits, cash balances needed for check clearing or other operational needs, and fixed assets.
  - A high ratio of total earning assets to total non-earning assets may indicate a stronger focus on the core business, combined with a low percentage of assets that do not contribute to value generation and a weaker competitive position.
- **LLP_IR**: Ratio of loan-loss provisions to net interest revenue
  - Loan-loss provisions are the traditional approach to manage credit risk. A decrease in loan-loss provisions relative to interest revenue indicates an improving quality of the bank's loan portfolio and/or an increase in the use of more sophisticated risk management tools. In both cases, one would expect to observe a negative relationship between loan-loss provisions and bank stock returns.
  - Literature: Thakor (1987), Strong and Meyer (1987), Moser (1998), Roger and Sinkey (1999), Grammatikos and Saunders (1990), Madura and Zarruk (1992), Lancaster et al. (1993), Docking et al. (1997).

Fundamental variables (4)

- **OB_TA:** Ratio of the nominal value of off-balance sheet items to total assets
  - The banking sector faces the surge in the volume of derivatives, options, and structured products like swaps, letters of credit, loan commitments, and credit default swaps. Unlike traditional interest business, they do not have a direct effect on the bank's balance sheet.
  - Problems: (1) Net exposure differs from the aggregate gross position. (2) Unclear whether banks use off-balance sheet instruments to hedge risk or to acquire additional risk exposure.
  - Literature: Casu and Girardone (2005), Cooper et al. (2003), Avery and Berger (1991), Thakor (1991), Brewer et al. (2000), Carter and Sinkey (1998), Wang et al. (2005).
- **NI_TI**: Ratio of non-interest income to total operating income
  - While interest margins are dependent on interest-rate movements and economic cycles, fee income (albeit cyclical as well) provides diversification and greater stability of profits.
  - Problems: (1) Fee-based revenues are associated with greater operating leverage than lending activities. (2) Most fee-based activities do not require banks to hold additional regulatory capital, leading to greater financial leverage than the traditional lending business. Both changes in operating and financial leverage induce additional volatility in bank earnings.
  - Literature: Grammatikos et al. (1986), Canals (1993), Saunders and Walter (1994), Gallo et al. (1996), Rogers and Sinkey (1999), DeYoung and Roland (2001).

Fundamental variables (5)

- **CIR:** Cost to income ratio
  - Cost efficiency has become a key strategic target for banks. Many banks introduced tremendous cost-saving efforts including organizational changes (e.g., outsourcing), reductions in their branch network and number of employees, and concentration on their core business.
  - Next to the return on equity (ROE), the cost to income ratio is the most prominent benchmark measure in the banking industry.
  - Literature: Vander Vennet (2002), Peristiani (1997), Schure et al. (2004).
- **PE:** Price to earning ratio
  - A well documented phenomenon is the "post earnings announcement drift", where stock prices underreact subsequent to earnings announcements (Ball and Brown, 1968; Bernard and Thomas, 1990; Hew et al., 1996).
  - Empirically, stocks with low price earnings ratios (value stocks) outperform stocks with high price earnings ratios (growth stocks).
  - Banks have some discretion in reporting their earnings (e.g., through adjusted loan-loss provisions). If banks smooth their earnings, changes in earnings per share will impact future bank stock returns because they reveal inside information (signalling; Cooper et al., 2003).

Sample characteristics

	Mean	Std. dev.	Q25	Median	Q75
L_TA	0.620	0.166	0.521	0.622	0.739
E_NEA	26.689	18.384	12.577	21.081	33.896
LLP_IR	0.200	0.190	0.096	0.157	0.236
NI_TI	0.330	0.140	0.237	0.322	0.408
OB_TA	0.262	0.311	0.085	0.178	0.317
EQ_TA	0.079	0.039	0.052	0.068	0.098
CIR	0.630	0.117	0.560	0.626	0.696
PE	11.116	21.758	1.415	10.412	16.339
MCAP	4.165	12.313	0.062	0.244	1.679
BM	1.005	0.642	0.585	0.893	1.235
TRS	0.015	0.083	-0.023	0.005	0.043

This table provides a data description based on 235 European banks over the period from 1991 to 2005 taken from the Bankscope database. The following bank-specific variables are used: L_TA denotes the ratio of loans to total assets, E_NEA the ratio of total earning assets to total non-earning assets, LLP_IR the ratio of loan loss provisions to net interest revenue, NI_TI the ratio of non-interest income to total operating income, OB_TA the ratio of the nominal value of off-balance sheet items to total assets, EQ_TA the ratio of book value of equity to total assets, and CIR the cost to income ratio. The asset pricing variables are as follows: PE is the price earnings ratio, MCAP the market capitalization (given in billions of Euro), and BM the ratio of book value of equity to market value of equity. TRS denotes the total return to shareholders on a monthly basisis. Q 25 and Q75 are the 25% and 75% quintiles of the distribution, respectively.

Correlation coefficients of explanatory variables

	L_TA	E_NEA	LLP_IR	NI_TI	OB_TA	EQ_TA	CIR	PE	MCAP	BM
L_TA	1.000									
E_NEA	0.308	1.000								
LLP_IR	0.041	0.085	1.000							
NI_TI	-0.331	-0.315	0.016	1.000						
OB_TA	-0.161	-0.094	0.081	0.075	1.000					
EQ_TA	0.102	0.115	-0.163	-0.209	0.098	1.000				
CIR	-0.279	-0.184	0.065	0.143	0.038	-0.220	1.000			
PE	-0.088	-0.082	-0.064	0.143	-0.054	-0.135	0.054	1.000		
MCAP	-0.242	-0.217	-0.064	0.321	0.014	-0.237	0.008	0.139	1.000	
BM	0.260	0.148	0.105	-0.312	-0.079	0.181	0.043	-0.180	-0.262	1.000

This table provides a data description based on 235 European banks over the period from 1991 to 2005 taken from the Bankscope database. The following bank-specific variables are used: L_TA denotes the ratio of loans to total assets, E_NEA the ratio of total earning assets to total non-earning assets, LLP_IR the ratio of loan loss provisions to net interest revenue, NI_TI the ratio of non-interest income to total operating income, OB_TA the ratio of the nominal value of off-balance sheet items to total assets, EQ_TA the ratio of book value of equity to total assets, and CIR the cost to income ratio. The asset pricing variables are as follows: PE is the price earnings ratio, MCAP the market capitalization (given in billions of Euro), and BM the ratio of book value of equity to market value of equity. TRS denotes the total return to shareholders on a monthly basisis. Q 25 and Q75 are the 25% and 75% quintiles of the distribution, respectively.

Empirical issues (1)

- In a first step, we test whether a fixed effects or a random effects panel model is appropriate using the **Hausman (1978) specification test**:
  - Rejection of the random effects model (the null hypothesis) is highly significant, hence, we estimate a fixed effects model.
  - Stock returns as the dependent variable vary from month to month between April to June of year t+1, while the independent variables are annual accounting figures from the previous year t and remain constant by construction. The annual data reduce the variability of the independent accounting variables, implying potential correlation with the fixed effects and exaggerated significance levels.
- To check whether our main model is correctly specified, we also report the results from an alternative setup, where we condition the cumulative 3-months return from April to June in year t+1 on the annual accounting data from the previous year t.
  - This approach significantly reduces the number of observations. A Hausman specification test again indicates that the fixed effects model is the correct specification.
  - These results are intuitive because the selection of banks is assumed to represent a comprehensive description of the European banking industry rather than a randomly drawn sample.

Empirical issues (2)

- In a second step, we assume that both **firm effects** and **time effects** are present in our data. In this case, Fama-MacBeth standard errors are biased (Peterson, 2009).
  - The dependent variable consists of monthly stock returns, which supposedly exhibit (weak) serial correlation. Our independent (yearly) accounting variables will be persistent; in fact, serial correlation of these variables is large. Moreover, we cannot rule out autocorrelation in the residuals → **firm fixed effects** (and FMB SE biased).
  - As only a single industry in the same geographic region is analyzed, the yearly reporting figures will be affected by common shocks → **time fixed effects** (and FMB SE unbiased).
- We test **alternative panel estimators** to identify potential biases in the standard errors. The corresponding point estimates are equal to those reported in the tables below.
  - Robust standard errors are valid if only heteroscedasticity is present in the data. In contrast, SE with clusters either across companies or years can adjust for firm effects and time effects, respectively. As a remedy, **Driscoll-Kraay (1998) standard errors** cluster in multiple dimensions; they are unbiased and correct for both firm effects and spatial dependence.
  - The Driscoll-Kraay standard errors are up to 2 times larger in magnitude than the simple robust standard errors. We interpret this observation as indicating that Driscoll-Kraay standard errors should be used to derive conservative results.

Comparison of standard errors of alternative panel estimators

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	robust	cluster(id)	cluster(yr)	D-K	(2)÷(1)	(3)÷(1)	(4)÷(1)
L_TA	1.92	1.66	2.75	2.78	0.87	1.43	1.45
E_NEA	0.01	0.01	0.01	0.01	1.09	0.91	0.82
LLP_IR	0.79	0.88	0.91	0.84	1.11	1.14	1.07
NI_TI	1.57	1.67	2.15	2.03	1.06	1.37	1.30
OB_TA	0.61	0.82	0.80	0.72	1.34	1.30	1.18
EQ_TA	8.20	9.90	10.57	10.16	1.21	1.29	1.24
CIR	1.90	1.74	2.27	1.91	0.92	1.19	1.01
PE	0.01	0.01	0.01	0.01	1.00	1.13	1.00
Ln(MCAP)	0.29	0.37	0.55	0.59	1.29	1.90	2.05
BM	0.32	0.33	0.50	0.50	1.04	1.57	1.60
C	3.77	4.87	6.89	8.00	1.29	1.83	2.13

Column (1) reports robust standard errors based on the White (1980) variance-covariance matrix. Column (2) and (3) present the clustered standard errors based on Roger (1993), where clusters are across firms (id) and years (yr), respectively. The standard errors in column (4) are based on the Driscoll and Kraay (1998) methodology, controlling for both firm effects and spatial dependence.

In summary, both firm effects and time effects are present in our sample, and the random effects model can be rejected based on the Hausman (1978) specification test. We use a **fixed effects model combined with Driscoll and Kraay (1998) standard errors**. Standard errors are corrected for heteroscedasticity, autocorrelation, and spatial correlation, thereby avoiding inflated t-statistics and producing conservative significance levels.

Main panel regression results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
L_TA	9.308	5.787	9.407	9.307	8.878	8.864	32.306
	0.001 ***	0.065 *	0.001 ***	0.001 ***	0.002 ***	0.001 ***	0.000 ***
E_NEA	0.008						0.018
	0.323						0.572
LLP_IR	-4.068	-2.305	-3.537	-4.019	-3.634	-4.196	-13.851
	0.000 ***	0.007 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***
NI_TI	7.839	3.029	7.517	7.534	6.578	6.717	33.338
	0.000 ***	0.125	0.001 ***	0.001 ***	0.007 ***	0.005 ***	0.003 ***
OB_TA	1.318			1.372		1.421	5.772
	0.070 *			0.059 *		0.060 *	0.000 ***
EQ_TA	-16.525			-15.905		-20.585	-84.456
	0.105			0.111		0.050 *	0.137
CIR	5.256	6.797	5.863	5.316			24.077
	0.006 ***	0.000 ***	0.003 ***	0.007 ***			0.000 ***
PE	0.002						0.037
	0.845						0.420
ln(MCAP)	-1.214		-1.338	-1.333	-1.406	-1.387	-7.148
	0.041 **		0.020 **	0.020 **	0.013 **	0.013 ***	0.074 *
BM	0.424						-1.144
	0.401						0.572
C	6.025	-7.297	6.868	8.189	12.084	13.172	56.744
	0.452	0.008 ***	0.378	0.293	0.082 *	0.054 *	0.265
R2 (within)	0.020	0.009	0.018	0.020	0.015	0.018	0.065
N	6014	6014	6014	6014	6014	6014	1962
# groups	235	235	235	235	235	235	235

Panel regression for sub-periods with optional year dummies

	(1)	(2)	(3)	(4)	(5)	(6)
	1991-2005	1991 - 1998	1999 - 2005	1991-2005	1991 - 1998	1999 - 2005
	M3_base	M3_I	M3_II	M3_yd	M3_I_yd	M3_II_yd
L_TA	9.308	2.903	10.554	3.198	-1.876	7.093
	0.001 ***	0.487	0.002 ***	0.080 *	0.595	0.000 ***
E_NEA	0.008	0.007	0.024	0.020	0.008	0.022
	0.323	0.571	0.103	0.011 **	0.512	0.093
LLP_IR	-4.068	-3.500	-0.626	-2.641	-1.869	-1.400
	0.000 ***	0.012 **	0.415	0.000 ***	0.068 *	0.090 *
NI_TI	7.839	4.317	2.686	5.544	2.051	6.993
	0.000 ***	0.143	0.488	0.001 ***	0.265	0.012 **
OB_TA	1.318	1.782	3.269	1.428	2.424	1.686
	0.070 *	0.161	0.075 *	0.022 **	0.049 **	0.278
EQ_TA	-16.525	-8.401	-37.349	-25.915	-20.112	-42.001
	0.105	0.518	0.059 *	0.009 ***	0.129	0.019 **
CIR	5.256	5.974	1.305	-1.069	-3.247	0.447
	0.006 ***	0.005 ***	0.586	0.428	0.212	0.870
PE	0.002	0.026	-0.005	0.008	0.031	0.001
	0.845	0.114	0.296	0.334	0.079 *	0.839
ln(MCAP)	-1.214	-0.654	-2.915	-2.878	-2.620	-5.079
	0.041 **	0.352	0.106	0.000 ***	0.001 ***	0.024 **
BM	0.424	1.072	-0.518	-0.057	0.323	-1.483
	0.401	0.19	0.382	0.891	0.699	0.015 **
C	6.025	1.355	33.101	30.686	32.094	64.297
	0.452	0.878	0.155	0.000 ***	0.003 ***	0.035 **
R2 (within)	0.020	0.016	0.032	0.087	0.058	0.111
N	6014	2829	3185	6014	2829	3185
# groups	235	187	220	235	187	220

Panel regressions with alternative timing strategies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	M3_base	March M3	March M4	February M3	February M4	M6	M9
L_TA	9.308	5.116	6.425	1.349	3.424	5.004	4.084
	0.001 ***	0.061 *	0.012 **	0.576	0.137	0.021 **	0.018 **
E_NEA	0.008	0.011	0.008	0.016	0.010	0.003	0.001
	0.323	0.241	0.312	0.098 *	0.246	0.685	0.830
LLP_IR	-4.068	-4.102	-4.062	-3.875	-3.917	-2.534	-2.315
	0.000 ***	0.000 ***	0.000 ***	0.002 ***	0.000 ***	0.002 ***	0.000 ***
NI_TI	7.839	6.636	6.923	5.571	6.270	4.928	5.101
	0.000 ***	0.002 ***	0.001 ***	0.017 **	0.001 ***	0.029 **	0.003 ***
OB_TA	1.318	1.493	1.129	0.590	0.99	0.218	0.411
	0.070 *	0.083 *	0.106	0.547	0.221	0.715	0.378
EQ_TA	-16.525	-10.888	-14.205	-10.235	-9.549	-13.59	-13.149
	0.105	0.256	0.087 *	0.269	0.276	0.051 *	0.019 **
CIR	5.256	3.288	3.498	0.868	1.237	2.508	2.896
	0.006 ***	0.094 *	0.032 **	0.674	0.465	0.221	0.071 *
PE	0.002	0.011	0.004	0.004	0.004	-0.002	0.001
	0.845	0.275	0.65	0.592	0.583	0.721	0.767
ln(MCAP)	-1.214	-1.029	-0.964	-0.738	-0.913	-0.648	-0.532
	0.041 **	0.040 **	0.055 *	0.152	0.047 **	0.17	0.165
BM	0.424	0.447	0.203	0.277	0.397	1.039	0.846
	0.401	0.533	0.711	0.733	0.520	0.031 **	0.012 **
C	6.025	7.456	6.098	8.344	8.555	2.908	2.130
	0.452	0.345	0.402	0.282	0.225	0.660	0.690
R2 (within)	0.020	0.015	0.013	0.009	0.011	0.008	0.006
N	6014	6020	8027	6024	8034	12016	17901
# groups	235	235	235	235	235	235	235

Panel regressions with censored explanatory variables

	(1)	(2)	(3)
	Base	Censor_1%	Censor_5%
L_TA	9.308	8.020	6.345
	0.001 ***	0.015 **	0.061 *
E_NEA	0.008	-0.003	-0.006
	0.323	0.775	0.651
LLP_IR	-4.068	-3.856	-3.127
	0.000 ***	0.001 ***	0.176
NI_TI	7.839	7.938	6.333
	0.000 ***	0.000 ***	0.083 *
OB_TA	1.318	2.430	-0.689
	0.070 *	0.056 *	0.747
EQ_TA	-16.525	-14.426	-1.005
	0.105	0.116	0.928
CIR	5.256	5.318	8.308
	0.006 ***	0.056 *	0.067 *
PE	0.002	-0.002	-0.102
	0.845	0.957	0.010 ***
ln(MCAP)	-1.214	-0.777	0.426
	0.041 **	0.152	0.478
BM	0.424	0.844	1.432
	0.401	0.171	0.255
C	6.025	0.634	-14.753
	0.452	0.935	0.095 *
R2 (within)	0.020	0.016	0.013
N	6014	5293	2993
# groups	235	224	172

Main empirical results (1)

- This paper investigates the impact of traditional and non-traditional financial intermediation activities on banks' profitability, as measured by stock returns subsequent to the release of the relevant accounting figures.
- Our valuation model contains bank specific variables and asset pricing factors.
  - The underlying assumption is that the information contained in the fundamental variables predicts bank stock returns for a longer time-span because of their close connection to the value creation process of a bank.
  - We estimate panel regressions and implement different corrections for the standard errors to control for heteroscedasticity, autocorrelation, and spatial correlation.
- Our results reveal that bank-specific variables exhibit a very robust explanatory power for bank stock returns across the different model specifications. Overall, the valuation of bank stocks incorporates both the classical loan-related side of banking activities and the growing off-balance activities.
- The ratio of loans to total assets (L_TA) has a positive impact on bank stock returns, indicating that markets incorporate the classical side of business when they value banks and the utilization of the balance sheet.

Main empirical results (2)

- The ratio of non-interest income to total income (NI_TI) has a positive impact, implying that lower dependence on the classical lending business is an indicator for a bank's financial health. The result could also be driven by higher operating and financial leverage.
- The ratio of off-balance sheet items to total assets (OB_TA) has a positive impact, indicating that banks create shareholder value when they engage in this growing business area rather than build up an uncompensated risk exposure.
- The ratio of loan-loss provisions to net-interest income (LLP_IR) has a negative impact, suggesting that increasing loan-loss reserves are associated with a deteriorating quality of a bank's loan portfolio and a subsequent decrease in profitability.
- The ratio of equity to total assets (EQ_TA) has a negative impact, indicating that tight capital management is necessary for banks because excessive equity cushion makes it hard to earn a competitive return on funds.
- Both Fama-French asset pricing factors, the book to market ratio and market capitalization, are significant in several of our regression specification.