WORKING PAPER

BANK PERFORMANCE IN EUROPE AND THE US: A DIVERGENCE IN MARKET-TO-BOOK RATIOS

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Bank performance in Europe and the US: a divergence in market-to-book ratios [★]

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Abstract

Post 2008, the market-to-book ratios of European and US banks have diverged markedly. We use panel regressions to investigate the determinants of the M/B ratios of 112 European and US banks. We show that the underperformance of European banks is mainly driven by non-performing loans and by the negative impact of policy rates on bank interest margins. The higher US bank valuations are mainly driven by higher profitability and better cost efficiency. Our results for European banks stress the importance of timely NPL resolution and imply that low-for-long monetary policy may harm bank health.

Keywords: market-to-book ratio, European banks, US banks, franchise value, bank performance

JEL: G21 G28 E52

1. Introduction and motivation

We investigate the determinants of the market-to-book (M/B) ratios of European and US banks in the post-crisis period. During this period, M/B ratios of European and US banks have strongly diverged, with European banks clearly underperforming their US counterparts. The performance gap has been a cause

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for concerns raised not only by bank regulators and supervisors (Constâncio, 2017; ECB, 2019; IMF, 2017), but also by the specialized press (The Economist, 2019).

Both European and US banks were hit by the banking crisis in 2007-2009. Yet, the policy responses differed markedly. The US authorities promptly implemented a bank recapitalization plan and the accommodative monetary policy of the Federal Reserve, supported by fiscal stimulus, caused an economic recovery. In contrast, European banks were hit by a sovereign debt crisis in 2011-2013. Since most countries applied fiscal austerity, monetary policy was forced to provide stimulus, but the ECB only acted decisively from 2012 onwards. Moreover, some ECB policies, such as the low-for-long interest rates and the introduction of negative deposit rates for banks, have detrimental effects on the profitability of banks (Heider et al., 2019; Borio et al., 2017). These differences in economic recovery and monetary policy may have an impact on the financial markets' assessment of the long-term performance potential of banks, causing diverging M/B ratios.

Before and after the financial crisis, a number of studies have attempted to describe the drivers of bank M/B ratios (Jordan et al., 2011; Bogdanova et al., 2018; Calomiris and Nissim, 2014) or Tobin's Q ratios (Chousakos and Gorton, 2017). None of these papers, however, compares performance between European and US banks after the crisis. In this paper, we use panel regressions to analyze the difference in M/B ratios between European and US banks in the post-crisis period. We find that low profitability is one of the main reasons for the slow recovery of M/B ratios in Europe and that this effect is mainly related to decreasing net interest margins. This is confirmed by observing a negative influence of low interest rates on European M/B ratios. In the US, this negative influence of monetary policy is not found. US banks' M/B ratios have improved

after the crisis thanks to higher profitability, mainly driven by improved cost efficiency. For European banks, our results also reveal a negative impact of non-performing loans on bank valuations.

The analysis proceeds as follows. We describe the M/B ratio gap between European and US banks from 2008 onwards. Next, we examine the power of key bank and market variables in explaining the post-crisis evolution of banks' M/B ratios in Europe and the US. Finally, we identify the contribution of the main explanatory variables to the diverging M/B ratios.

2. Methodology and data

M/B ratio. We focus on the M/B ratio, because it is an often-used measure for bank franchise value, i.e. long-term bank performance potential (Demsetz et al., 1996). Banks with high M/B ratios (above one) are awarded a premium by the market above the book value of their equity, typically driven by intangible value from e.g. rents accruing from an established market position, strong operational efficiency or cross-selling opportunities. M/B ratios below one, on the other hand, are a sign of market distrust, for instance due to delayed loss recognition or an unfit business model.

Explanatory power of bank and market variables. To analyze the determinants of the M/B ratios, we estimate a panel regression model for the European and US banks:

$$M/B_{i,t} = \alpha_i + \sum_{j=1}^{J} \beta_j BS_{j,i,t} + \sum_{k=1}^{K} \gamma_k MR_{k,t} + \epsilon_{i,t} \tag{1}$$

The M/B ratio (bank i, year t) is regressed on J bank ($BS_{j,i,t}$) and K market ($MR_{k,t}$) variables. By dividing all variables by their within standard deviation, we make the resulting coefficients comparable between Europe and

the US. The regressions are estimated with bank fixed effects (hence α_i) and errors are clustered at bank-level.

Explanatory variables. We consider the influence of 11 bank variables and 2 market variables on the M/B ratio. We include ln(assets) to control for any size-related effects (Kolaric et al., 2018; Moenninghoff et al., 2015). We capture the composition of bank balance sheets with the loans/assets and deposits/assets ratios, as in Mergaerts and Vander Vennet (2016). We examine the influence of capital adequacy (equity/assets) since better capitalized banks should be more resilient to shocks (Sarin and Summers, 2016) and perform better in crises periods (Berger and Bouwman, 2013; Vazquez and Federico, 2015). In terms of profitability, we include return on assets (ROA) and hypothesize a positive relationship with the M/B ratio, as in Bogdanova et al. (2018). We also consider the components of profitability by examining the impact of the net interest margin (NIM), noninterest income (nonint/income) and cost efficiency (cost/income). Higher non-interest income provides diversification, but may also be more volatile (Baele et al., 2007). Regarding asset quality, we include non-performing loans (NPL/loans), as well as the coverage ratio, i.e. the share of NPL covered by loan loss provisions (LLP/NPL). We expect NPL to have a negative impact on bank performance, in line with Bogdanova et al. (2018). Finally, we include the natural logarithm of the Z-score (ln(Z)), as a distance-to-default measure capturing bank risk (Delis et al., 2012). In terms of market variables, we include the evolution of the STOXX Europe 600 and S&P 500 (market) to account for the general evolution of the stock market. We include the Overnight Index Swap rate (OIS) to capture the effect of monetary policy on M/B ratios.

Data. We select all listed banks with assets exceeding EUR 20 billion and with loans and deposits above 20% of assets in order to focus on banks engaged in

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intermediation. This yields a sample of 112 listed banks, 67 European[2] and 45 US. All bank variables are collected on a yearly basis from S&P Global Market Intelligence (SNL), whereas market variables are obtained from Eikon.
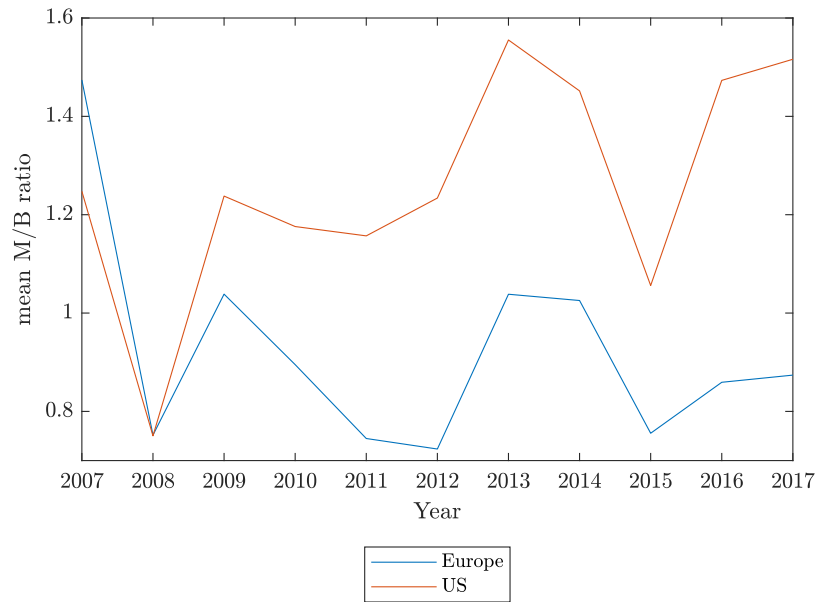
3. Results

Figure 1: Yearly mean M/B ratios in Europe and the US

M/B ratio gap. Figure 1 shows that M/B ratios in Europe and the US were above 1 at the start of the crisis. In 2008, banks' M/B ratios plummeted, both in Europe and the US, to 0.75. From that almost identical level, the divergence started. In Europe, a new trough was reached during the sovereign debt crisis

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[2]In Europe, the division of the banks - according to the location of their headquarters - is as follows: 4 in Austria, 1 in Belgium, 12 in Switzerland, 2 in Germany, 2 in Denmark, 8 in Spain, 1 in Finland, 3 in France, 7 in the United Kingdom, 4 in Greece, 3 in Ireland, 12 in Italy, 2 in the Netherlands, 2 in Norway, 1 in Portugal and 3 in Sweden.

and bank performance remained poor (mean M/B ratio around or below one) afterwards. US bank M/B ratios, on the other hand, recovered steadily (except for 2015). Consequently, a very large performance gap has emerged: US banks' mean M/B ratio reached 1.5 in 2017, whereas the M/B ratio of the average European bank was still stuck below 0.9.

Explanatory power of bank and market variables. Table 1 shows the results of the panel regressions. First, we observe a negative impact of size on the M/B ratio. This is in line with Minton et al. (2019), who find a negative relationship between size and bank value, partly driven by the negative market assessment of trading activities. Regarding capital structure, we find that an increase in the the equity/eassets ratio has a negative impact on bank performance. A possible explanation is that equity is a relatively costly source of financing (Aiyar et al., 2014) or that higher capital ratios might be a consequence of more risky operations or assets (Calomiris and Wilson, 2004). The negative effect is especially significant in Europe, which might also be associated to the simultaneous occurrence of low crisis-induced M/B ratios and the increase in capital ratios due to the gradual adherence to the Basel III capital requirements (i.e. a more mechanical explanation). In terms of profit capacity, ROA is an important driver of M/B ratios, both in Europe and the US. An increase in ROA of one standard deviation is associated with an increase in M/B ratio of about 0.18 in Europe and 0.09 in the US. When we disentangle the different components of profitability, the net interest margin is found to be most important in Europe, while cost efficiency is the main driver for US banks. Regarding loan quality, a higher share of non-performing loans has a detrimental impact on European bank M/B ratios, while the effect is insignificant in the US. Both in Europe and the US, however, we find that a higher coverage ratio has a positive influence on banks' M/B ratio.

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Table 1: Panel estimations of the M/B ratio (2007-2017)

Column Dependent var.	Europe (1) M/B	US (1) M/B	Europe (2) M/B	US (2) M/B
$\ln(\text{assets})_s$	-6.308***	-10.252**	-4.106**	-9.886***
	(1.958)	(3.937)	(2.045)	(3.326)
$\text{loans/assets})_s$	-0.395	3.994	-0.288	1.526
	(1.804)	(2.716)	(1.814)	(2.220)
deposits/assets_s	1.125	3.768	1.500	3.810
	(1.649)	(3.457)	(1.897)	(3.550)
equity/assets_s	-8.372***	-12.658	-7.793***	-13.561*
	(3.068)	(7.745)	(2.626)	(8.043)
ROA_s	17.780***	8.900***		
	(2.639)	(2.730)		
NIM_s			5.890**	5.132
			(2.521)	(3.838)
nonint/income_s			2.580	19.763
			(2.725)	(16.467)
cost/income_s			-0.875	-8.720**
			(3.359)	(3.820)
NPL/loans_s	-3.226	2.871	-4.910***	0.768
	(2.219)	(2.199)	(1.850)	(2.075)
LLP/NPL_s	8.431**	6.024**	8.765**	5.231**
	(3.468)	(2.533)	(3.515)	(2.436)
$\ln(\text{Z})_s$	-0.962	3.438	0.235	3.885
	(1.625)	(2.551)	(1.669)	(2.659)
OIS_s	13.017***	-3.074	14.439***	-3.339
	(2.834)	(3.859)	(3.157)	(3.611)
market_s	11.212***	21.229***	11.229***	22.375***
	(2.298)	(6.071)	(2.474)	(6.404)
Bank fixed effects	Yes	Yes	Yes	Yes
R^2_w	0.408	0.355	0.368	0.370
No. of banks	66	43	66	43
No. of obs	579	443	568	431

Note: Variables are standardized using the within standard deviation. The numbers in parentheses are standard errors. Standard errors are clustered at bank level. *, ** and *** indicate significance at 10%, 5% and 1% respectively.

Turning to the market variables, we observe a clear dichotomy for the effect of monetary policy on bank M/B ratios between European and US banks. The coefficient of the OIS rate is large and significantly positive in Europe, but it is insignificant in the US. In Europe, an increase (decrease) in the OIS rate of one standard deviation is associated with an increase (decrease) in M/B ratio of 0.13, which is substantial. Combined with the finding that the net interest margin is an important profitability component for European banks, the conclusion is that the accommodative monetary policy of the European Central Bank has become an important driver of low European bank M/B valuations.

Contribution of the main explanatory variables. Figure 1 shows that the mean M/B ratios in Europe and the US were almost identical (0.75) in 2008, but diverge afterwards. In order to identify the causes of the divergence, we analyze the evolution of the main M/B ratio determinants in the post-2008 period for European and US banks. Table 2 compares (using the Welch-Satterthwaite test) the mean values in 2008 and 2017 for the significant variables in Table 1.

A first finding is that the mean equity/assets ratio has significantly increased in Europe, while it remained constant in the US. As stated before, this might provide a mechanical explanation for the significantly negative sign of the equity/assets variable in Europe.

Next, ROA is clearly a key explanation for the performance gap between Europe and the US. We conclude from the panel regression that a higher ROA is associated with a higher M/B ratio and Table 2 shows that ROA in Europe evolved negatively (although not significant), while it improved significantly for the average US bank. These results are in line with earlier studies, reporting a positive impact of ROA on the M/B ratio (Bogdanova et al., 2018; ECB, 2019). Moreover, they confirm the concerns of supervisors, e.g. Constâncio (2017), regarding European banks' low profitability.

Table 2: Evolution of explanatory variables over time

		Europe			US	
ln(assets)	mean	stdev.	% change	mean	stdev.	% change
2008	18.7	1.7	0,8%	17.2	1.7	4,7%**
2017	18.8	1.4		18.0	1.3	
equity/assets	mean	stdev.	% change	mean	stdev.	% change
2008	6.0	2.6	28,9%***	10.8	3.3	8,3%
2017	7.7	2.5		11.7	2.3	
ROA	mean	stdev.	% change	mean	stdev.	% change
2008	0.5	0.6	-27,8%	-0.3	2.7	407,8%***
2017	0.4	0.6		1.0	0.4	
NIM	mean	stdev.	% change	mean	stdev.	% change
2008	1.8	0.8	-18,3%**	3.5	0.8	-7,1%
2017	1.5	0.6		3.2	0.6	
cost/income	mean	stdev.	% change	mean	stdev.	% change
2008	66.3	36.4	-4,4%	81.1	54.1	-26,3%**
2017	63.4	14.2		59.8	7.7	
NPL/loans	mean	stdev.	% change	mean	stdev.	% change
2008	3.8	3.6	114%***	1.9	1.3	-36%***
2017	8.1	11.4		1.2	0.9	
LLP/NPL	mean	stdev.	% change	mean	stdev.	% change
2008	57.9	25.2	29%	124.7	71.4	-5,5%
2017	74.7	78.6		117.8	105.5	
OIS	mean	stdev.	% change	mean	stdev.	% change
2008	0.7	NA	-152,3%	0.2	NA	784,2%
2017	-0.4	NA		1.7	NA	
market	mean	stdev.	% change	mean	stdev.	% change
2008	57.7	NA	110,2%	60.3	NA	231%
2017	121.2	NA		199.7	NA	

Note: The Welch-Satterthwaite test is used to compare mean values in 2008 and 2017. *, ** and *** indicate a significant difference at 10%, 5% and 1% respectively.

Third, when we disentangle the ROA components, we find that the net interest margin, which exerts a significant positive effect on M/B ratios, decreased significantly over time for European banks, but not for the US banks. This is confirmed by considering the OIS rate: the coefficient in the panel regressions is significantly positive in Europe, suggesting that lower values go hand in hand with lower bank performance. At the same time, we find that the OIS rate has decreased in Europe in 2008-2017. Our findings therefore support recent concerns about the low-for-long interest rates in Europe raised by Heider et al. (2019); Borio et al. (2017); Claessens et al. (2018). In the US, the main profit-related channel seems to be cost efficiency: the mean US cost/income ratio has significantly decreased between 2008 and 2017, which has a positive impact on bank valuations. In Europe, this channel is not significant, possibly due to a lack of cost efficiency progress, as reported in ECB (2019).

Finally, in terms of asset quality, Table 2 indicates that the share of non-performing loans has significantly increased in European banks, partially due to the European debt crisis. Based on the the negative coefficient in the panel regressions, NPL contribute significantly to low M/B ratios in European banks. Our findings are consistent with too slow NPL resolution and forbearance (Lamers et al., 2019) and therefore support the emphasis that regulators put on tackling NPL (Constâncio, 2017; ECB, 2019). For the US, on the contrary, the share of NPL has decreased over time and the coverage ratios in US banks are much higher than in European banks.

4. Conclusions

Importance of profitability. Our results show that one of the main drivers of bank M/B ratios is bank profitability, typically measured by ROA. While ROA has increased considerably in the US after the crisis, it remained very low in

Europe. In the US, the improvement in cost efficiency has been an important driver of improved profitability. For European banks, the net interest margin remains the main driver of performance, but it has been under negative pressure in recent years. When European banks want to sustainably improve their M/B ratios, cost efficiency will be an essential driver.

Danger of low-for-long interest rates. The short-term interest (OIS) rate is found to be positively related to European banks' M/B ratio, but has no significant impact on US banks. Therefore, a persistent period of low interest rates caused by a prolonged accommodative monetary policy stance (of the ECB) in Europe could have substantial negative effects on bank franchise values and M/B valuations. Hence, a more growth- and inflation-friendly macroeconomic stance, e.g. through fiscal policies, may be warranted to restore a more benign interest rate environment.

Non-performing loans management. Finally, our results with respect to asset quality call for decisive action in tackling legacy assets and the clean-up of non-performing loans in Europe. This requires resolution actions on the part of supervisors as well as a harmonization of bankruptcy and litigation regulations across Europe.

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