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Social aspirations in European banks: peer-influenced risk behavior

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Abstract

We test a sample of 3,586 banks from 33 European countries to determine whether performances above or below a social aspiration level (median performance of peer banks) influence banks' aggregate risk levels. Our results are consistent with the behavioral theory of the firm and prospect theory in that we find that bank performance below a bank's social aspiration level is followed by increased aggregate risk, i.e., risk-taking behavior in the subsequent year. Although under-performing banks tend to be risk-takers, large banks and banks with high aggregate risk levels tend to limit the increase in their aggregate risk levels.

JEL codes: D22, G2, G41, L22, L25
Keywords: social aspiration, European banks, performance, risk behavior, prospect theory

Highlights

- We study the risk behaviors of European banks.
- Bank's risk behavior depends on its performance relative to the social aspiration level.
- Performance above a bank's social aspiration level leads to lower risk-taking.
- Performance below a bank's social aspiration level leads to higher risk-taking.

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Introduction

Perhaps the most prominent topic in organizational learning is learning from performance feedback, which stems from the classic work of Cyert and March (1963). Initially, when examining how performance influences firms' risk behavior, studies assumed that this relationship is the same regardless of whether a firm's performance is below or above some aspiration (benchmark) level (e.g., Bromiley, 1991) that serves as a reference point for decision makers (Kahneman and Tversky, 1979). Later, the literature tended to debate how firms act when their performance is below their aspiration level. Two competing empirical findings exist: 1) performance below an aspiration level promotes increased risk-taking (Gooding et al., 1996; Greve, 1998; Miller and Chen, 2004; Lim and McCann, 2014); and 2) performance below an aspiration level leads both to a sense of danger and to risk aversion (Miller and Bromiley, 1990; Wiseman and Bromiley, 1996; Mishina et al., 2010).[1]

Audia and Greve (2006) challenged this conflict and demonstrated that corporate risk behavior depends on whether the gap between performance and aspiration level is perceived as a threat to firm survival or whether that gap is repairable. They argued that larger firms with extensive resources are not afraid of failure, and thus, they perceive below-aspiration-level performance as repairable and are ready to assume greater risk. In contrast, smaller firms with limited resources are risk averse.

Using a large sample of European banks, we contribute to the literature of risk-taking (and specifically, to banks' risk-taking) by testing whether the performance of peer banks affects an individual bank's risk behavior. More specifically, we estimate three models to determine whether

(1) Bank performance above/below the social aspiration level tends to reduce/increase financial leverage:
Hypothesis 1: Performance above the aspiration level leads to risk aversion.
Hypothesis 2: Performance below the aspiration level leads to risk-taking.

(2) Bank performance above/below the social aspiration level tends to more significantly reduce/increase the overall risk level when the risk level is higher at the baseline period *t*:
Hypothesis 3: Performance above the aspiration level leads to risk aversion that is magnified by banks with higher aggregate risk levels.
Hypothesis 4: Performance below the aspiration level leads to risk-taking that is alleviated by banks with higher aggregate risk levels.

(3) Bank performance above/below the social aspiration level tends to more significantly reduce/increase the overall risk level according to the size of the bank at the baseline period *t*:
Hypothesis 5: Performance above the aspiration level leads to risk aversion that is magnified by the size of the bank.
Hypothesis 6: Performance below the aspiration level leads to risk-taking that is alleviated by the size of the bank.

[1] For an excellent review on risk-taking, see Hoskisson et al. (2017).

1 Data and methodology

Our sample is composed of 3,586 banks from 33 countries in Europe[2] and was obtained from the Bureau van Dijk's Orbis database. We use data for banks in Europe (including non-European Union banks) that were available for the period 2014 (t) and 2015 (t+1). All the variables were winsorized at the 0.10% and 99.9% percentiles to mitigate the effect of outliers on our analysis. Our sample is heterogeneous in that the number of banks across countries differs substantially, from two banks in Andora and Lichtenstein to 1,529 banks in Germany. Therefore, in the robustness section, we re-estimate our models using several sub-samples that cover a more homogenous sample of countries.

For this preliminary study, we chose the simplest risk measure in the form of an equity multiplier to measure the financial leverage (total assets to equity – *TAE*) and two basic performance measures (*ROE* – return on equity and *ROA* – return on assets[3]), and we measure the social aspiration level as a median of the performances of other banks in a given country. To examine whether the effect of past performance on the aggregate risk measure differs with respect to past performance, we split the performance measure *PM* into above the aspiration level, *AA*(*PM*), and below the aspiration level, *BA*(*PM*). More specifically, if a bank's performance measure is above the median performance in country j of baseline year t, then the $AA(PM)_{i,t}$ is equal to $[PM_{i,t} - med(PM_{i\in j,t})]$ (a positive number), and zero otherwise. Similarly, if a given bank's performance measure is below the median performance in country j of baseline year t, then the $BA(PM)_{i,t}$ is equal to $[PM_{i,t} - med(PM_{i\in j,t})]$ (a negative number), and zero otherwise.

Our dependent variable is $\Delta TAE_{i,t+1}$[%], i.e., the percentage of change in *TAE* from t to the next period, t+1, for bank i. Although there are options other than *TAE* for measuring bank risk, this is a basic measure used in several studies, whereas in a utility-maximizing and mean-variance framework, it can be argued that risk-averse banks will choose lower financial leverage (e.g., Shrieves and Dahl, 1992; Adrian and Shin, 2014; Delis et al., 2017).

Control variables are used to consider firm-specific factors and environment. In addition to country dummies, we include *LTA*, log of total assets; *LLP*, ratio of loan loss provision to total loans; *LAB*, ratio of loans and advances to banks to total assets; and *S*, market share of a bank in a given country based on total assets.

For each performance variable, we estimate three models. Baseline Model 1 tests whether performance above or below the aspiration level affects risk behavior differently (Hypotheses 1 and 2). In Model 2, we test whether in conjunction with the past performance level, aggregate risk influences risk behavior (Hypotheses 3 and 4). Because of collinearity, this model does not directly control for risk level, which is already incorporated into the interaction terms. Finally, in Model 3, we test whether, in conjunction with the past performance level, bank size influences risk behavior (Hypotheses 5 and 6). For the same reason, the size of the bank is not directly included in the specification. All models are

[2] Andora (2), Austria (468), Belgium (19), Bulgaria (17), Switzerland (172), Cyprus (24), Czech Republic (21), Germany (1529), Denmark (60), Estonia (5), Spain (91), Finland (22), France (174), United Kingdom (100), Greece (7), Croatia (25), Hungary (18), Ireland (9), Island (4), Italy (466), Lithuania (5), Latvia (10), Luxemburg (37), Liechtenstein (2), Malta (7), Netherlands (17), Norway (110), Poland (31), Portugal (21), Romania (16), Sweden (76), Slovenia (10) and Slovakia (11).

[3] Most often used firm-level aspiration; see Bromiley and Harris (2014) for other aspiration measures.

estimated via ordinary least squares (OLS), whereas standard errors and significances are reported based on pairwise bootstrapping (standard errors based on HC1 of MacKinnon and White, 1985; lead to the same conclusions).

Model 1:

$$\Delta TAE[\%]_{i,t+1} = \alpha_0 + \alpha_1 LTA_{i,t} + \alpha_2 LLP_{i,t} + \alpha_3 LAB_{i,t} + \alpha_4 S_{i,t} + \alpha_5 TAE_{i,t} + \sum_j \gamma_j DUM_{i,t} + \beta_1 AA(PM)_{i,t} + \beta_2 BA(PM)_{i,t} + \varepsilon_{i,t} \quad (1)$$

Model 2:

$$\Delta TAE[\%]_{i,t+1} = \alpha_0 + \alpha_1 LTA_{i,t} + \alpha_2 LLP_{i,t} + \alpha_3 LAB_{i,t} + \alpha_4 S_{i,t} + \sum_j \gamma_j DUM_{i,t} + \beta_1 AA(PM)_{i,t} + \beta_2 BA(PM)_{i,t} + \beta_3 AA(PM)_{i,t} \times TAE_{i,t} + \beta_4 BA(PM)_{i,t} \times TAE_{i,t} + \varepsilon_{i,t} \quad (2)$$

Model 3:

$$\Delta TAE[\%]_{i,t+1} = \alpha_0 + \alpha_1 LTA_{i,t} + \alpha_2 LLP_{i,t} + \alpha_3 LAB_{i,t} + \alpha_4 S_t + \alpha_5 TAE_{i,t} + \sum_j \gamma_j DUM_{i,t} + \beta_1 AA(PM)_{i,t} + \beta_2 BA(PM)_{i,t} + \beta_5 AA(PM)_{i,t} \times LTA_{i,t} + \beta_6 BA(PM)_{i,t} \times LTA_{i,t} + \varepsilon_{i,t} \quad (3)$$

2 Results

The results for the full sample of the 3,586 banks are reported in Tables 2 (*ROE*) and 3 (*ROA*), and the corresponding descriptive statistics of the variables employed are presented in Table 1.

Table 1 Descriptive statistics and correlations

		Mean	Std. dev	1	2	3	4	5	6	7	8	9	10
1	*TAE*	13.10	9.59	1.00									
2	*ΔTAE* [%]	–2.02	12.90	–0.25	1.00								
3	*LTA*	20.43	1.81	0.22	–0.13	1.00							
4	*LLP*	0.01	0.02	–0.03	0.06	0.02	1.00						
5	*LAB*	0.12	0.13	0.03	0.05	–0.13	0.03	1.00					
6	*S*	0.01	0.03	0.03	–0.04	0.43	0.11	–0.02	1.00				
7	*AA(ROA)* [%]	0.45	0.70	–0.19	0.02	–0.04	0.05	0.09	0.06	1.00			
8	*BA(ROA)* [%]	–0.42	0.84	–0.05	–0.10	–0.02	–0.47	–0.08	–0.05	0.14	1.00		
9	*AA(ROE)* [%]	4.14	5.34	0.17	–0.08	0.11	0.01	0.07	0.08	0.67	0.14	1.00	
10	*BA(ROE)* [%]	–4.79	10.41	–0.07	–0.03	–0.04	–0.47	–0.05	–0.04	0.12	0.90	0.15	1.00

Notes: N = 3586. Means and standard deviations (Std. dev) for AA(ROA), BA(ROA), AA(ROE) and BA(ROE) variables are calculated excluding the 0s from the sample. Correlation coefficients above 0.04 are significant at the 0.01 or lower level.

Hypotheses 1 and 2:

Estimates of the coefficients for performance above the aspiration level (β_1) are negative (see Model 1 in Tables 2 and 3), suggesting that performance above the aspiration level leads to risk aversion, i.e., the higher the past performance, the greater the reduction of the aggregate risk level. These results are consistent with *Hypothesis 1*.

A performance below the aspiration level is also associated with negative coefficient estimates (β_2); however, these coefficients are multiplied with a negative difference between

the performance measure and the larger aspiration level. Therefore, the behavior of banks that experienced failure suggests risk-taking. This effect was statistically significant only for *ROA*, a result that is consistent with *Hypothesis 2*.

Table 2 Estimation results for *ROE*

	Model 1		Model 2		Model 3	
Constant	**15.574**	***	**14.946**	***	**4.295**	*
	[4.293]		[4.229]		[2.789]	
Total assets to equity	**–0.338**	***			**–0.347**	***
	[0.043]				[0.045]	
Log of total assets	**–0.582**	***	**–0.705**	***		
	[0.177]		[0.164]			
Loan loss provisions	–28.714		**–36.402**	*	–30.363	
	[27.849]		[28.004]		[29.481]	
Loans and advances to banks to total assets	**5.564**	**	**4.291**	*	**5.974**	**
	[2.986]		[2.999]		[2.956]	
Market share based on total assets	0.642		1.607		-8.852	
	[8.753]		[8.539]		[8.319]	
Above aspiration (ROE)	**–0.146**	**	0.060		–0.146	
	[0.075]		[0.140]		[0.803]	
Below aspiration (ROE)	–0.038		**–0.678**	***	**–1.563**	**
	[0.082]		[0.182]		[0.829]	
Above aspiration (ROE) x total assets to equity			**–0.022**	***		
			[0.008]			
Below aspiration (ROE) x total assets to equity			**0.047**	***		
			[0.010]			
Above aspiration (ROE) x log of total assets					–0.001	
					[0.038]	
Below aspiration (ROE) x log of total assets					**0.075**	**
					[0.039]	
Country dummies			YES			
adj.R^2	10.60%		10.40%		10.70%	

Notes: Bootstrapped standard errors in brackets. The **,* ***, and* *** *denote significance at 10%, 5%, and 1%, respectively.*

Hypotheses 3 and 4:

To facilitate the interpretation of the interaction terms apart from the estimated coefficients (Model 2 in Tables 2 and 3), we visualize the fitted effects of performance and the interaction terms on banks' aggregate risk levels (see Figure 1 for *ROE* and Figure 2 for *ROA*). The overall effect of estimated coefficients (β_1 and β_3) for performances above the aspiration level is consistent with *Hypothesis 1* (see Figures 1 and 2). When banks are successful and achieve a performance above the aspiration level, aggregate risk levels decreased, and they decrease even more for banks subject to higher aggregate risk levels. This is consistent with the risk-aversion behavior of successful banks, i.e., with *Hypothesis 3*. With respect to *ROA*, the coefficient for the *AA*(*ROA*) variable is now positive, whereas it was negative for Model 1. This suggests that for low levels of risk, banks that are successful may actually be risk seeking. Although this is not consistent with *Hypothesis 3*, it is intuitively appealing because for banks with a low aggregate risk level, there is significant space to take additional risk. However, assuming an average level of *AA*(*ROA*) at 0.45 (Table 1), such behavior would be expected for banks that have a *TAE* below 5.75, which corresponds to only the 5th quantile of the empirical distribution of *TAE* in our sample.

The results for banks that achieved a performance below the aspiration level are consistent with both *Hypotheses 2* and *4* (see Model 2 in Figures 1 and 2). This is because our results suggest that although performance below the aspiration level leads to an increased aggregate risk level (negative β_2), this is alleviated by the size of the aggregate risk level (positive β_4), i.e., the higher the bank's aggregate risk level, the lower the increase in the aggregate risk in the next period. Moreover, the results indicate both that banks below the aspiration level tend to be risk takers and that their risk-taking is rationally limited by their current level of aggregate risk.

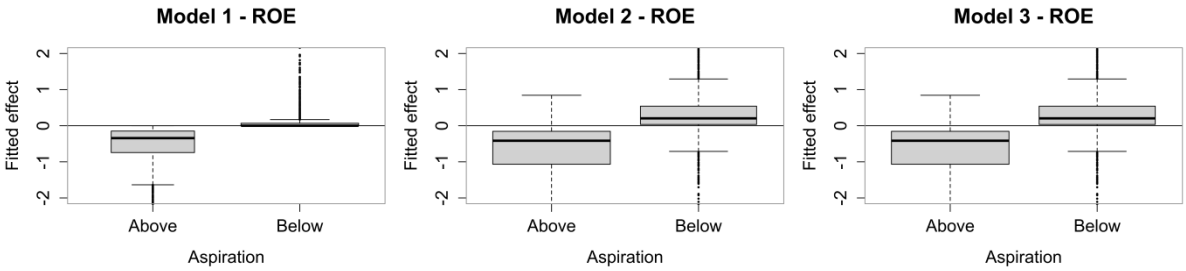

Figure 1 Predicted overall contributions of above and below aspiration *ROE* to the changes in risk

Notes: For the sake of exposition, we show only values from –2 to +2 on the y-scale, although some extreme fitted values reach up to –40 and +40.

Hypotheses 5 and 6:

When banks' behaviors are conditioned on their size, as measured by the *log of total assets*, we find that although banks that achieve results above the aspiration level tend to decrease their aggregate level, the coefficients are no longer significant. Thus, these results are not consistent with *Hypothesis 5*. Whereas banks that performed below the aspiration level increased their aggregate risk level (see Model 3 in Figures 1 and 2), this effect is alleviated by the size of the bank (negative β_6), i.e., the larger the bank, the lower its risk appetite. This result is consistent with *Hypotheses 2* and *6*.

When considering whether bank size influences banks' risk behaviors, the results are similar to those when banks' behaviors are conditioned on their aggregate risk levels. The correlation between the *Log of total assets* and *Total assets to equity* is 0.22 (Table 1), which, although significant, is still small, suggesting that the two results are distinct.

Table 3 Estimation results for *ROA*

	Model 1		Model 2		Model 3	
Constant	**16.188**	***	**15.024**	***	**4.103**	*
	[4.182]		[4.226]		[2.863]	
Total assets to equity	**–0.378**	***			**–0.367**	***
	[0.046]				[0.044]	
Log of total assets	**–0.600**	***	**–0.721**	***		
	[0.167]		[0.165]			
Loan loss provisions	**–57.542**	**	–40.794		**–57.660**	**
	[29.897]		[30.784]		[29.762]	
Loans and advances to banks to total assets	**4.745**	*	2.879		**4.430**	*
	[2.840]		[2.800]		[2.934]	
Market share based on total assets	2.812		3.105		–0.118	
	[8.735]		[8.599]		[8.038]	
Above aspiration (ROA)	**–0.955**	*	**2.000**	*	4.138	
	[0.699]		[1.368]		[5.788]	
Below aspiration (ROA)	**–2.438**	***	**–8.192**	***	**–32.380**	***
	[1.006]		[1.573]		[9.304]	
Above aspiration (ROA) x total assets to equity			**–0.348**	**		
			[0.163]			
Below aspiration (ROA) x total assets to equity			**0.541**	***		
			[0.106]			
Above aspiration (ROA) x log of total assets					–0.251	
					[0.288]	
Below aspiration (ROA) x log of total assets					**1.502**	***
					[0.451]	
Country dummies			YES			
adj.R^2	11.60%		10.90%		12.70%	

Notes: Bootstrapped standard errors in brackets. **,* ***, and* *** *denote significance at 10%, 5%, and 1%, respectively.*

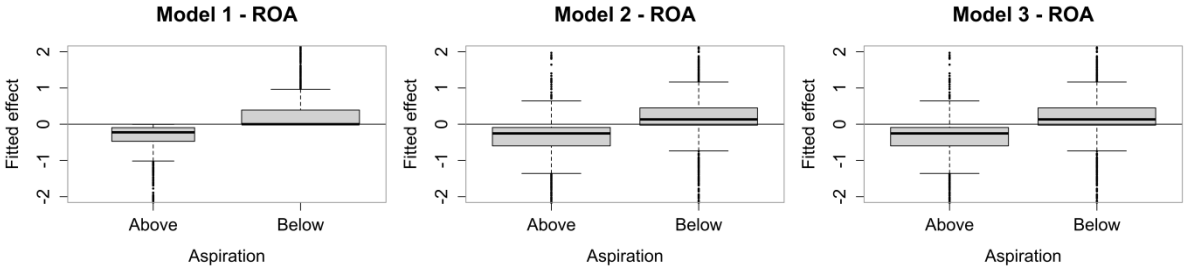

Figure 2 Predicted overall contributions of above and below aspiration *ROA* to changes in risk
Note: For the sake of exposition, we show only values from –2 to +2 on the y-scale, although some extreme fitted values are between –40 and +40.

3 Robustness checks and conclusions

Our sample consists of heterogeneous group of countries. Therefore, we re-estimated our models across sub-samples. First, we selected seven developed countries that had more than 50 banks in our sample and were (in 2015) members of the European Union, namely, Italy, France, Germany, the UK, Austria, Spain, and Denmark. Next, we selected a sample of 14 countries that are members of the European Union, their sample size within our sample was more than ten banks per country, and they do not belong to the post-communism sample of countries. This group includes Belgium, Cyprus, Finland, Luxemburg, Netherland,

Portugal and Sweden, along with the seven previously mentioned countries. Finally, we selected 11 central and eastern European countries, namely, Bulgaria, the Czech Republic, Estonia, Croatia, Hungary, Lithuania, Latvia, Poland, Romania, Slovenia, and Slovakia.

We also examined how the results differ with respect to variations in aspiration levels. Along with country-level medians, we considered using country-level averages and the overall median performance level across all countries.

We summarize our results in Table 4. The results related to the behavior of banks that performed poorly, i.e., below performance aspiration levels, are robust across estimation settings.

Table 4 Hypothesis evaluations across different samples and aspiration levels

	Hypotheses					
	H1	*H2*	*H3*	*H4*	*H5*	*H6*
Full sample	C	C	C	C	N	C
7 developed countries	N	C	C	C	N	C
14 non-CEE countries	N	C	C	C	C	C
11 CEE countries	N	N	N	C	N	N
Country means as aspiration level	C	C	N	C	N	C
Global median as aspiration level	C	C	C	C	N	C

Notes: C denotes results that are consistent with the hypothesis in the column, and N denotes results that are inconsistent.

Our study contributes both to the literature on risk-taking and to the expanding literature on Basel capital regulation, risk, and bank efficiency. Several robustness checks confirm our strongest result, i.e., that performances below the aspiration level lead to risk-taking behavior by banks, thus increasing the aggregate risk level. However, this risk-taking is mitigated by banks' sizes and overall aggregate risks, i.e., larger and more leveraged banks tend to take less risk when their performance is low. These results are consistent both with the prospect theory of Kahneman and Tversky (1979) and with the classic work on the behavioral theory of the firm (Cyert and March, 1963). Although we test our hypotheses both in a large sample and in sub-samples of European banks, future research should consider using other risk and performance measures and time periods.

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