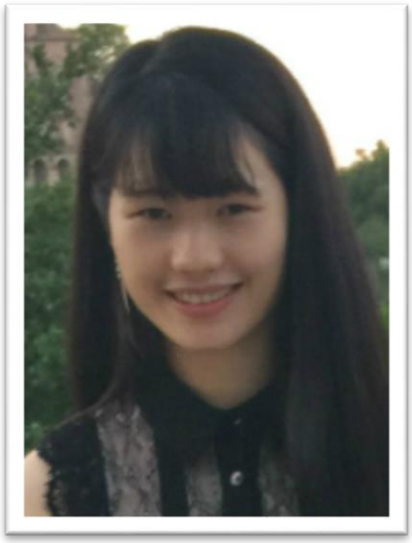
Belgian Financial Forum

Analysis of the Risk of Banks and Insurance Companies in Europe Using Accounting Information



Ying Liang, Ph.D. at Toulouse School of Economics

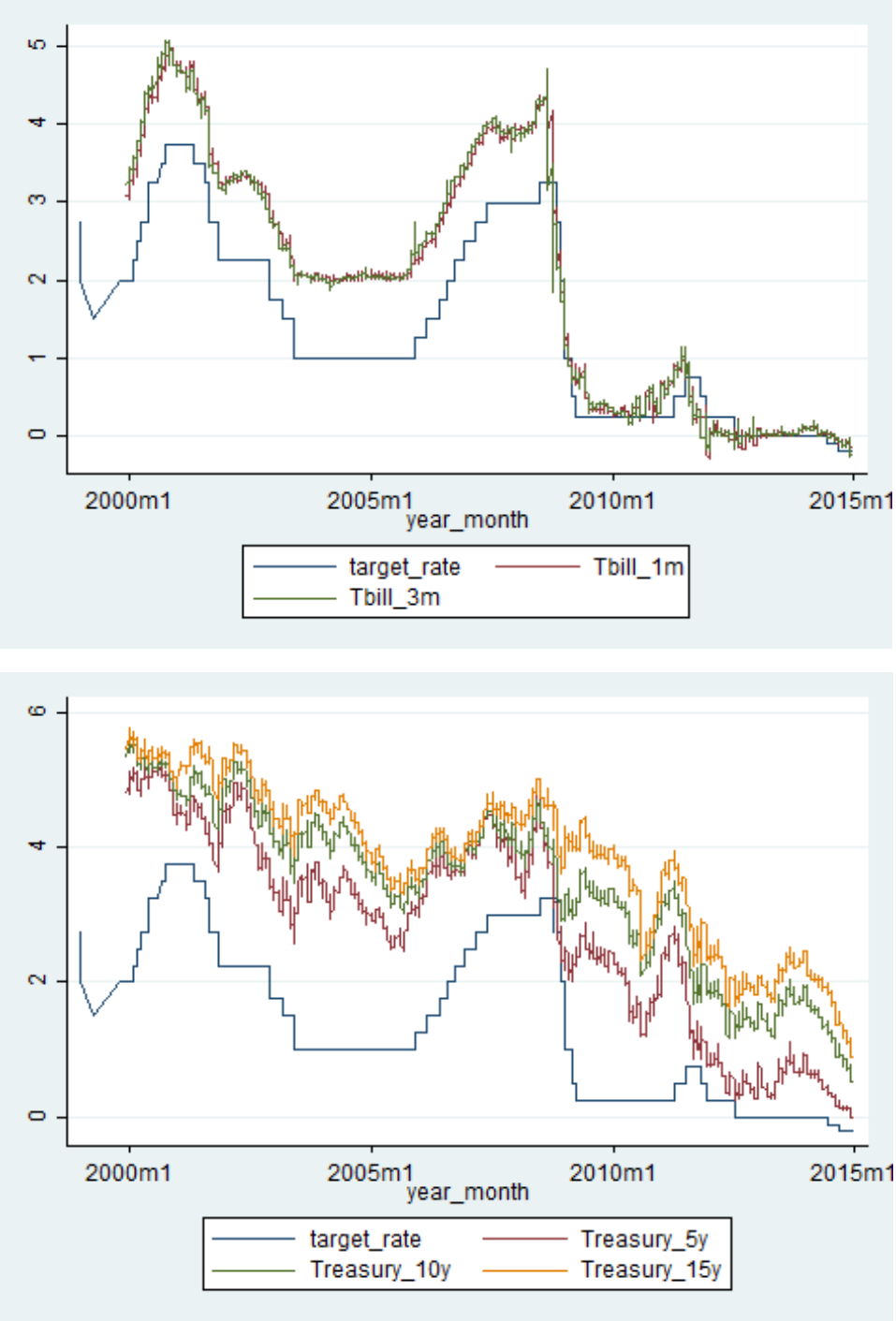
In this article, I focus on accounting data that provide a view of the real economic activities of the various financial institutions, providing evidence on the diversification of the financial conglomerates. Using yearly data from the Eurozone market (plus the UK and Switzerland) over the period 1999-2014, I compute the correlations between various accounting and financial ratios of banks and insurance companies and compare them to other industries. I have found that the banking and insurance industries are positively (of net sales, gross profit, to net income), but not perfectly, correlated. Their level of correlation does not appear particularly high compared to the correlations between the banking industry and several other industries. There is room to do diversification for banks and insurance industries; especially when facing the interest rate risk.

1. Introduction

The prolonged low-interest rate environment has had a lot of impact on many segments of the economy, especially a lot of challenges for the insurance industry and banking sector. Since 2008, interest rates have gradually declined to historical lows. Life insurers are adversely impacted by interest rates because of the guarantees and policy holder options in many of the products they sell. As a result, life insurers face a considerable amount of interest rate risk, particularly those with a high amount of interest-sensitive policies in their mix products. Central banks have implemented many unusual monetary policy measures aimed at keeping rates low, so called “extraordinary measures”, including also a number of bond purchases (quantitative easing) and lengthening the average maturity

of treasuries held in its bond portfolios. The goal of these measures was to lower longer-term interest rate, resulting in a flatter yield curve, in hopes of avoiding deflation, reducing the unemployment rate, lowering mortgage rates and stimulating the economy. This special economic environment irritates again the topic of merging banking and insurance sector due to the potential benefits from synergism.

Figure 1: The Evolution of Interest Rates in EZ During 1999-2015



From the two upper graphs in Figure 1, we can observe that the short-term interest rates (1-month, 3-month) follow the same trend as the target rates set by the central bank. Moreover, after the financial crisis, the market interest rates are virtually equal to the target rate; even a negative interest rate level is observed from 2014. On the other hand, the evolution of long-term interest rates differs from the evolution of short-term rates: the correlation with the target rate appears weaker. As a result, it's interesting to investigate not only the role of interest rates but also the role of the slope of the yield curve.

The emergence of financial conglomerates that deal with banking and insurance activities is not a recent phenomenon. For example, in 2002 Dresdner Bank became a wholly owned subsidiary of the insurance corporation Allianz; Royal Bank of Scotland Group acquired UK Churchill Insurance Co Ltd in 2003. Until now, a long-standing debate in the academic literature focuses on the economic consequences of these conglomerates. On the one hand, conglomerates can offer diversification benefit, that might not be ripped by individual investors due to transaction costs. In this view, modern portfolios theory states that holding two non-perfectly correlated assets can diversify the volatility risk; the combinations of banks and insurance makes sense even if these activities are positively correlated to the extent that their correlation is not perfect and that some efficiency gains or synergies can be generated. On the other hand, integrating different financial activities within the same entities might also lead to various problems, including the fact that managers might choose excessive levels of risk and the fact that regulating these conglomerates might be more difficult. It is thus an empirical question to determine what is the relative risk of banking and insurance activities.

The conglomerate of companies is a controversial topic, an amount of literature argued the benefits of the conglomerate from different sides: the scale of economies, debt capacity and tax shield and the creation of the internal capital market. While regulators are a bit strict about the cross-sector combinations, especially to those in the finance sector which is a key and sensitive department in the whole economy. At the same time, corporation diversification may bring dark sides as well; such as the agency problem. Until now, some papers are dedicated to the diversification risk and income variations of banks with non-banking activities. While mixed results are obtained on this topic.

On one hand, a number of arguments1Boyd, Graham and Hewitt (1993) simulated mergers between BHCs firms in non-banking financial industries and found that banks' mergers with insurance or property & casualty insurance firms may reduce risk. Lelyveld and Knot (2008) found that there was no universal diversification discount for EU. They use the defined financial conglomerates in Eurozone to investigate the mixedness to firm excess value (the excess M/B to average value). can be made in favor of a more integrated financial services industry. Recently, Fields, Fraser, and Kolari (2007) suggested the viability of bancassurance and found positive gains and no significant risk shifts for shareholders of bidding firms; Slijkerman et al (2013) also proved that downside risk can be reduced through financial conglomeration across European banks and insurers. On the other hand, different opinions are offered as well. The earlier literature (Lang and Stulz (1994), Servaes (1996)) showed significant diversification discount: firms that engage in multiple activities are valued less. Acharya,

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Hasan, and Saunders (2006) found that diversification of bank loans across sectors and industries does neither necessarily improve return nor reduce risk. Both De Jonghe (2010) and Brunnermeir, Dong, and Palia (2012) argue that diversification may reduce firm-specific risk but at the expense of adding to systemic risk due to the increased interconnectedness among FIs.

In this article, I focus here on accounting data that provide a view of the real economic activities of the various financial institutions. Using yearly data from the Eurozone market (plus the UK and Switzerland) over the period 1999-2014, I compute the correlations between various accounting and financial ratios of banks and insurance companies and compare them to other industries.

I have found that the banking and insurance industries are positively (of net sales, gross profit, to net income), but not perfectly, correlated. Their level of correlation does not appear particularly high compared to the correlations between the banking industry and several other industries.

2. Correlations across industries

I first present the correlation matrix of the various accounting income variables among all the industries at the aggregate level. I then focus our analysis on the link between banks and insurance companies at the firm level. I get access to yearly financial firm-level data for the Eurozone (thereafter EZ), UK and Switzerland thanks to InFinancial. This dataset includes the balance sheet data of all European firms from 1999-2014. There are 140 banks, 26 full lines insurers, 3 insurance brokerage firms, 16 life insurers, 15 P&C insurers and 6 reinsurance companies in the EZ sample (1,661 firm-year observations). There are 91 additional banks and insurance companies in UK and Switzerland. I use data from the European Central Bank (thereafter ECB) to identify the banks and insurance companies that are in fact financial conglomerates.

2.1 Correlations of pure banks, pure insurances and financial conglomerates with other industries at the aggregate level in Europe from 1999-2014

I separate the financial conglomerates from the bank and insurance sector and investigate how the pure banking industry, the pure insurance industry and the financial conglomerates correlate with each other and with other industries.

The sample covers all firms from Eurozone, Switzerland and UK, called Europe in the report.

Net Sales (same as Total Revenues, called “Net Sale” in industrial sector) represent a measure of cash flows generated by the firm business. On the other hand, the Gross Return on Equity (Gross ROE), computed as the Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) divided by the book value of Equity, and the Return On Equity (ROE), computed as the net income variables divided by the book value of equity, reflect the economic performance of the firms. For each year, I compute the aggregate value of the Net Sales, Gross ROE, and ROE at the industry level by computing the value-weighted average across the firms of a given industry. I use the total asset value in order to compute the weighted average.

Table 1 presents the correlations of net sales in Eurozone, Switzerland and UK across all the industries from 1999 to 2014. The p-values2If the p-value is less than or equal to the chosen significance level (α), the test suggests that the observed data are inconsistent with the null hypothesis, so the null hypothesis must be rejected. A result is said to be statistically significant if it corresponds to the rejection of the null hypothesis.indicated below the correlations correspond to the test of the hypothesis H 0 that the correlation between the two industries is equal to 0. The smaller a p-value is, the more confidence we have in rejecting H0. The net sales of banking and insurance industries display a correlation of 0.4831, with a p-value of 0.058, which is statistically significant at 10% level.

Compared to other industries 3 , Industry Category in InFinancial: Banks(Bank); Insurance(Ins); Automobiles & Parts(Auto); Basic Resources(BRes); Chemicals(Chemi); Construction & Materials(Constr); Financial Services(FinS); Food & Beverage(Food); Health Care(Heal); Industrial Goods(IndGS); Media(Media); Oil & Gas(Oil); Personal & Household Goods(HHG); Real Estate(RealEs); Retail(Retail); Technology(Tech); Telecommunications(Tele); Travel & Leisure(Travel); Utilities(Util). banking and insurance industries do not appear to have particularly high correlations in terms of net sales. As a comparison, construction and travel industries are showing higher correlations with the banking industry, 0.8544 and 0.8321 respectively. Chemistry, oil, and Personal & Household Goods industries all appear more correlated with banks than insurance companies.

The insurance industry appears also correlated with the construction industry, 0.6296, but mildly with the travel industry, 0.5975. More generally, in terms of net sales, the level of correlation of the insurance industry with other industries appear lower than the one of the banking industry. This appears in line with the fact that the banking industry is more directly involved in the financing of economic activity.

[2] If the p-value is less than or equal to the chosen significance level (α), the test suggests that the observed data are inconsistent with the null hypothesis, so the null hypothesis must be rejected. A result is said to be statistically significant if it corresponds to the rejection of the null hypothesis.

[3] Industry Category in InFinancial: Banks(Bank); Insurance(Ins); Automobiles & Parts(Auto); Basic Resources(BRes); Chemicals(Chemi); Construction & Materials(Constr); Financial Services(FinS); Food & Beverage(Food); Health Care(Heal); Industrial Goods(IndGS); Media(Media); Oil & Gas(Oil); Personal & Household Goods(HHG); Real Estate(RealEs); Retail(Retail); Technology(Tech); Telecommunications(Tele); Travel & Leisure(Travel); Utilities(Util).

Table 1: Correlation Matrix of Net Sales in Europe

	Bank	Ins	FC	Auto	BRes	Chemi	Constr	FinS
Bank	1							
Ins	**0.4831**	1						
	0.0580							
FC	**-0.4278**	**-0.0494**	1					
	0.0983	**0.8558**						
Auto	0.1324	0.5998	-0.0739	1				
	0.6251	0.0141	0.7856					
BRes	**0.7851**	0.6013	-0.5898	0.5667	1			
	0.0003	0.0138	0.0162	0.0221				
Chemi	**0.7876**	0.6404	-0.6140	0.5972	0.9684	1		
	0.0003	0.0075	0.0114	0.0146	0.0000			
Constr	**0.8544**	0.6296	-0.6175	0.4752	0.9259	0.9744	1	
	0.0000	0.0090	0.0108	0.0628	0.0000	0.0000		
FinS	-0.1650	-0.2871	0.3055	-0.0687	-0.1448	-0.2343	-0.2840	1
	0.5413	0.2810	0.2500	0.8005	0.5925	0.3824	0.2865	

	Bank	Ins	FC	Food	Heal	IndGS	Media	Oil	HHG
Ins	0.4831	1							
	0.0580								
FC	-0.4278	-0.0494	1						
	0.0983	0.8558							
Food	0.5429	0.5843	-0.5615	1					
	0.0298	0.0175	0.0236						
Heal	-0.0098	-0.1252	0.0681	0.0755	1				
	0.9712	0.6440	0.8021	0.7811					
IndGS	0.1774	0.0442	0.4952	-0.3132	0.1124	1			
	0.5109	0.8709	0.0511	0.2376	0.6784				
Media	**-0.7025**	-0.5382	0.0642	-0.3101	0.2038	-0.1976	1		
	0.0024	0.0315	0.8133	0.2425	0.4491	0.4632			
Oil	**0.6626**	0.5411	-0.2594	0.7333	0.1140	0.2875	-0.6200	1	
	0.0052	0.0304	0.3320	0.0012	0.6742	0.2803	0.0104		
HHG	0.6871	0.6170	-0.5741	0.9758	0.0632	-0.1986	-0.4478	0.8059	1
	0.0033	0.0109	0.0200	0.0000	0.8161	0.4608	0.0820	0.0002	

	Bank	Ins	FC	RealEs	Retail	Tech	Tele	Travel	Util
Ins	0.4831	1							
	0.0580								
FC	-0.4278	-0.0494	1						
	0.0983	0.8558							
RealEs	-0.3586	-0.1817	-0.1450	1					
	0.1726	0.5007	0.5921						
Retail	-0.2557	-0.1153	-0.2022	0.9880	1				
	0.3392	0.6706	0.4527	0.0000					
Tech	**-0.5224**	-0.4642	-0.0913	0.3207	0.2314	1			
	0.0379	0.0701	0.7367	0.2259	0.3886				
Tele	**0.8362**	0.4058	-0.2497	-0.6185	-0.5167	-0.6572	1		
	0.0001	0.1189	0.3509	0.0107	0.0404	0.0057			
Travel	**0.8321**	0.5975	-0.4357	-0.4430	-0.3353	-0.7016	0.7786	1	
	0.0001	0.0145	0.0916	0.0857	0.2043	0.0025	0.0004		
Util	**0.7634**	0.4643	-0.6877	-0.4005	-0.3143	-0.5067	0.7110	0.9194	1
	0.0006	0.0700	0.0032	0.1242	0.2358	0.0452	0.0020	0.0000	

Financial conglomerates' net sales appear independent (at 5% significant level) from the banking and insurance industries' one, which is an indication that conglomerates enjoy a good diversification in their operational activities.

Table 2 (in the appendix) presents the correlations of Gross ROE, namely the EBITDA divided by the book value of equity. Using this measure of economic activity, the banking industry appears to not be correlated with the insurance industry nor with the other industries (except the oil and the utility industries).

As indicated in Table 3(in the appendix), the ROE of the banking industry is not highly correlated with the one of the insurance industry, the correlation being 0.6066. This number has to be compared with the correlations of the banking industry with the automobiles, basic resources, oil, real estate, retail and travel industries, the correlations being 0.6492, 0.5977, 0.5412, 0.6492, 0.5977, and 0.5576, respectively.

This subsection shows that the correlations of the accounting results between the banking and insurance industries; which are positive, but not particularly high compared to the correlations of the banking industry with other industries. Complementary correlation table of NBI (net banking income) also support our results. Similar results are obtained if we only include the Eurozone firms.

2.2 Correlation of banks and sub-sectors of insurance industry

The insurance industry is classified into 5 sub-sectors according to their main activities: full line insurance, life insurance, property &casualty insurance (P&C), reinsurance, and brokerage. In this sub-section, I extend our analysis to investigate the correlations between all the banks and different types of insurance companies.

Table 4: Panel B: ROE Correlation Matrix of Banks and Sub-sectors of Insurance

	Bank	Full line	Life	P&C	ReIn	Broker
Bank	1					
Full line	0.4868	1				
	0.0559					
Life	0.6718	0.7297	1			
	0.0044	0.0013				
P&C	0.8030	0.5910	0.6378	1		
	0.0002	0.0159	0.0079			
Reinsurance	0.1594	0.7652	0.4832	0.4239	1	
	0.5554	0.0006	0.0580	0.1018		
Broker	0.4566	0.3438	0.4523	0.6046	0.2875	1
	0.0754	0.1923	0.0786	0.0131	0.2803	

Table 4 presents the results at the aggregate industry level. It shows that, apart from the Net Sales of banks and full line insurance companies, accounting measures of activity in the banking and various insurance industries do not seem highly correlated; insurance brokerages are even negatively correlated with banks' on Net Sales.

Conclusions

This report studies the relative risk of the banking and insurance industries by studying how these two industries activities correlate with each other and how their correlation compares to other industries.

I find that in Europe the banking and insurance industries are positively, but not perfectly, correlated. Their level of correlation does not appear particularly high compared to the correlation between the banking industry and several other industries. A similar story can be told if we only consider the Eurozone firms.

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Appendix

Table 2: Correlation Matrix of Gross ROE in Europe (EBITDA/Equity)

	Bank	Ins	FC	Auto	BRes	Chemi	Constr	FinS
Bank	1							
Ins	**-0.2287**	1						
	0.3943							
FC	**0.7409**	**0.2709**	1					
	0.001	0.3101						
Auto	0.2994	-0.0797	0.4431	1				
	0.26	0.7692	0.0856					
BRes	0.0007	-0.1073	-0.0336	-0.3791	1			
	0.9979	0.6925	0.9016	0.1476				
Chemi	0.3697	-0.094	0.4892	0.7764	-0.7405	1		
	0.1587	0.7292	0.0545	0.0004	0.001			
Constr	0.2163	-0.0661	0.3745	0.1269	0.7699	-0.2455	1	
	0.421	0.8079	0.153	0.6395	0.0005	0.3595		
FinS	-0.1643	-0.2591	-0.5012	-0.5114	-0.0308	-0.4225	-0.453	1
	0.5431	0.3326	0.0479	0.0429	0.91	0.103	0.078	

	Bank	Ins	FC	RealEs	Retail	Tech	Tele	Travel	Util
Ins	-0.2287	1							
	0.3943								
FC	0.7409	0.2709	1						
	0.001	0.3101							
RealEs	0.1969	0.008	0.4731	1					
	0.4647	0.9766	0.0642						
Retail	0.0154	0.2448	0.4574	0.4413	1				
	0.955	0.3608	0.0748	0.0871					
Tech	0.2601	-0.0737	0.3551	-0.0541	0.0692	1			
	0.3306	0.7861	0.1772	0.8422	0.799				
Tele	0.0164	-0.1404	0.2921	0.7426	0.4376	0.2605	1		
	0.9518	0.6041	0.2723	0.001	0.0901	0.3298			
Travel	0.136	0.3011	0.4388	-0.0115	0.3454	0.5259	0.2374	1	
	0.6155	0.257	0.0891	0.9663	0.1901	0.0364	0.3761		
Util	0.4705	0.4072	0.8662	0.3236	0.5693	0.5425	0.4195	0.6557	1

Table 3: Correlation Matrix of ROE in Europe								
	Bank	Ins	FC	Auto	BRes	Chemi	Constr	FinS
Bank	1							
Ins	**0.6066**	1						
	0.0127							
FC	**0.8832**	**0.6053**	1					
	0.0000	0.013						
Auto	**0.6492**	0.1212	0.6271	1				
	0.0065	0.6547	0.0093					
BRes	**0.5977**	0.5162	0.6229	0.4235	1			
	0.0145	0.0406	0.0099	0.1021				
Chemi	0.2226	0.8393	0.2501	-0.2044	0.3071	1		
	0.4073	0.0000	0.3502	0.4477	0.2473			
Constr	-0.0022	0.5793	0.087	-0.5712	0.0979	0.754	1	
	0.9935	0.0187	0.7486	0.0208	0.7182	0.0007		
FinS	0.5576	0.6029	0.4977	0.1652	0.3252	0.5165	0.443	1
	0.0248	0.0134	0.0498	0.5408	0.2191	0.0405	0.0857	

	Bank	Ins	FC	Food	Heal	IndGS	Media	Oil	HHG
Ins	0.6066	1							
	0.0127								
FC	0.8832	0.6053	1						
	0.0000	0.013							
Food	0.3977	0.3703	0.1936	1					
	0.1271	0.158	0.4725						
Heal	-0.0724	0.113	0.0804	0.3154	1				
	0.7898	0.6768	0.7672	0.2341					
IndGS	0.3731	0.7946	0.373	0.1146	0.1936	1			
	0.1546	0.0002	0.1547	0.6726	0.4724				
Media	0.1106	0.7404	0.138	0.1517	0.2972	0.8019	1		
	0.6835	0.001	0.6103	0.5749	0.2636	0.0002			
Oil	**0.5412**	0.28	0.6466	0.1398	0.5087	0.267	0.1175	1	
	0.0304	0.2935	0.0068	0.6055	0.0442	0.3174	0.6648		
HHG	0.2324	0.4553	0.0008	0.5078	0.0609	0.4298	0.4247	0.0905	1
	0.3863	0.0764	0.9977	0.0447	0.8227	0.0966	0.1011	0.7388	