OESTERREICHISCHE NATIONALBANK
EUROSYSTEM

Are Banks Different? Evidence from the CDS Market

B. Raunig and M. Scheicher

The opinions do not necessarily reflect those of the ECB or the OeNB

Introduction

Banks are at the centre of the recent economic crisis

Some special characteristics of banks:

- **Central function in the economy**
- **Maturity mismatch**
- **High leverage**
- **Significant trading activities (often)**

These characteristics may cause valuation uncertainty, agency problems etc.

Consequence → Regulation

Introduction

Some questions:

- **Do investors discriminate between banks and non-banks?**
- **Has judgment changed over time?**
- **Has the crisis changed the view of investors?**

We look at market pricing of banks' default risk = CDS to learn more about these issues

CDS

CDS = Traded insurance against firms' default

- **CDS is most popular CRT instrument**
- **Uses: Hedging, short-selling, CDOs etc.**
- **Coverage: More than 1500 firms & sovereigns**
- **Trading with constant T (like IRS), mostly 5 years**

Regular Premium = 'CDS *Spread*'

- **Paid by 'Protection buyer' to 'Protection Seller'**
- **CDS premium ~ Estimate of credit spread**
- **Default: PS receives bond & pays e.g. 100 to PB**

CDS

Market pricing of banks' default risk = CDS premium ("spread")

Understanding CDS premium = *Statistical information on default risk* vs. *risk premium*

Crucial to analyse market signals in turmoil or crisis. Are rising CDS premia due to increasing default risk or larger risk premium?

Decomposition of CDS premium

Based on a simple intensity model with constant hazard rate

$$C = EL + RP = (1-R)*PD + RP$$

EL expected loss
RP risk premium
R recovery rate
PD default probability

Decomposition of CDS premium

linear decomposition is simple but useful in answering our questions because:

- **Economically interpretable**
- **Standard approximation in the market**

More complex models do (of course) exist but:

- **Results are hard to interpret meaningfully**
- **Reflect more researchers view then the market view**

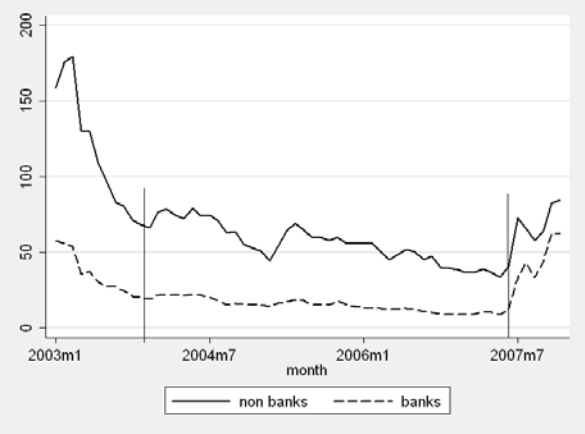
Data

CDS premium on senior debt, 5Y maturity

Final sample: 213 European & US firms

- **Bloomberg data base**
- **Match & filter CDS and stock prices**
- **Monthly data: 1 / 2003 - 12 / 2007**
- **Main industries represented, broad range of ratings**
- **All Large & Complex Financial Institutions (BoE definition): We include Bear Stearns, Lehman, Merrill Lynch, WaMu etc.**

CDS premium banks vs. nonbanks (median)



Default probability

Our decomposition C = (1-R)*PD +RP requires an estimate of PD.

We use EDF from KMV as an estimate of PD:

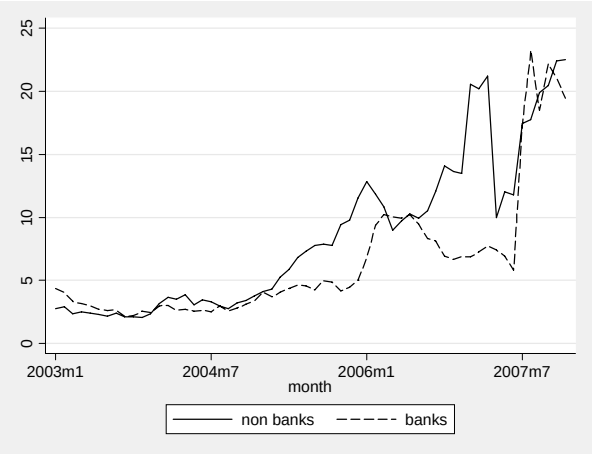
- **EDF = 1Year probability of a firm's default**
- **EDF = real-world PD. cleansed of risk preferences**
- **Good forecasting of defaults, used by many market participants**

Another decomposition is C = (1-R)*λ

λ risk neutral probability

The ratio λ/PD should tell us something about risk aversion

Risk neutral vs. real world PD



Baseline regression

$$C_{it} = \alpha + \beta_1 EDF_{it} + \beta_2 BANK * EDF_{it} + \nu_i + \varepsilon_{it}$$

Sub-periods:

Period 1: 1/2003 - 9/2003

Period 2: 10/2003 - 6/2007

Period 3: 7/2007 - 12/2007

Table 2: Fixed effects panel regression of CDS premium on empirical default probability

	Full sample	Period 1	Period 2	Period 3
EDF	61.20***	68.92***	44.50***	113.54***
	(9.63)	(8.22)	(8.84)	(28.49)
EDF x BANK	-7.11	0.17	-20.54*	414.73
	(12.12)	(8.47)	(11.43)	(280.29)
Const.	40.21***	47.16***	38.93***	54.99***
	(2.59)	(6.93)	(1.81)	(3.09)
R-sq:				
within	0.51	0.58	0.26	0.36
between	0.49	0.63	0.46	0.09
overall	0.48	0.63	0.35	0.12
N firms	213	183	213	209
N obs	12237	1537	9462	1238

Table 3: Fixed effects panel regression of CDS premium on empirical default probability and control variables

	Full sample	Period 1	Period 2	Period 3
EDF	54.71***	60.34***	40.11***	86.98***
	(9.75)	(6.45)	(8.49)	(19.60)
EDF x BANK	-14.54	-2.42	-34.25***	318.89
	(12.51)	(7.64)	(8.50)	(243.90)
RF	-15.80***	21.53**	-10.18***	-16.45***
	(1.80)	(8.60)	(1.89)	(5.03)
YSLOPE	-0.64	-39.26***	2.41**	21.63***
	(1.18)	(10.94)	(1.12)	(2.95)
VOLM	0.99***	0.47*	0.72***	-0.58**
	(0.32)	(0.28)	(0.17)	(0.29)
VOLID	0.66**	0.61	0.24	0.69**
	(0.30)	(0.38)	(0.15)	(0.27)
SWAP	103.33***	42.31*	28.99	114.39***
	(17.82	(24.19)	(18.69)	(20.93)
Const.	46.51***	19.60	52.88***	74.59***
	(7.19)	(17.52)	(6.78)	(25.40)
R-sq:				
within	0.56	0.63	0.29	0.49
between	0.52	0.64	0.49	0.16
overall	0.50	0.64	0.36	0.20
N firms	213	183	213	207
N obs	12219	1537	9454	1228

Table 5: Random effects panel regression of CDS premium on empirical default probability, control variables and interaction terms

	Full sample	Period 1	Period 2	Period 3
EDF	52.38***	60.22***	39.28***	89.82***
	(9.71)	(6.64)	(8.5)	(21.72)
EDF x BANK	-3.07	4.77	-29.02***	251.51
	(12.47)	(6.97)	(9.89)	(228.14)
RF	-16.16***	19.01**	-12.07***	-11.21**
	(2.09)	(8.77)	(2.28)	(4.93)
YSLOPE	-1.13	-40.28***	2.01	22.91***
	(1.42)	(12.54)	(1.37)	(3.31)
VOLM	0.88**	0.48	0.68***	-0.66**
	(0.34)	(0.34)	(0.19)	(0.33)
VOLID	1.11***	0.68*	0.65***	0.74**
	(0.23)	(0.39)	(0.12)	(0.31)
SWAP	89.52***	81.07***	32.61	108.25***
	(20.25)	(31.21)	(21.85)	(20.1)
RF x BANK	4.24	-10.71	9.92***	-28.38
	(2.84)	(9.39)	(2.35)	(17.75)
YSLOPE x BANK	1.47	19.77	1.28	-14.99**
	(1.83)	(13.34)	(1.44)	(5.83)
VOLM x BANK	-0.2	-0.39	-0.46**	0.84
	(0.38)	(0.36)	(0.19)	(0.66)
VOLID x BANK	-1***	-0.54	-0.63***	-0.06
	(0.25)	(0.39)	(0.12)	(0.46)
SWAP x BANK	30.86	-19.57	-30.79	-29.02
	(24.85)	(34.43)	(23)	(31.62)
BANK	-34.13***	-13.52	-44.89***	93.39
	(10.26)	(19.68)	(10.25)	(80.05)
Const.	51.37***	27.46	58.96***	61.88**
	(9.14)	(17.03)	(10.09)	(24.45)
R-sq:				
within	0.57	0.63	0.29	0.50
between	0.54	0.65	0.45	0.22
overall	0.53	0.65	0.39	0.25
N firms	213	183	213	207
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Period 2: Bubble

- **Expected losses generally lower and even much lower for banks**
- **Drivers of risk premium have virtually no impact on CDS premia of banks**
- **The simple fact of being a bank reduces CDS premia of banks a lot**

Period 3: Crisis

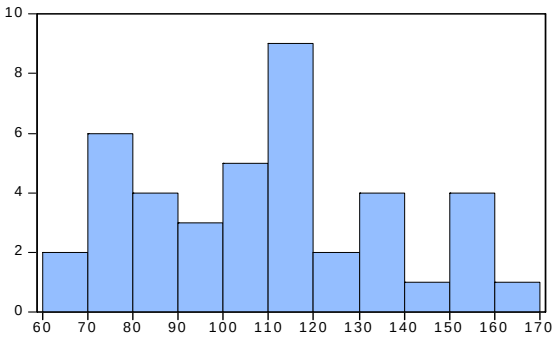
"Crazy" estimates of expected losses for banks with huge standard errors

Statistical reasons:

1. **Large heterogeneity in CDS premia of banks**
2. **In general very low EDF for banks**
3. **Little variation in the EDF of banks**

(1) + (2) + (3) produces the result

Period 3: Crisis



Change (%) in bank CDS period 2 vs. 3

Period 3: Crisis

Economic interpretation:

- **Investors did not believe in PD of KMV and revised PD upwards**
- **Heterogeneity in bank CDS premia reflects features of subprime turmoil**
- **Uncertainty about banks' exposures to ABS, CDO etc**
- **Uncertainty about valuation of banks**

Conclusions

- **CDS traders saw banks as "different" (=lower risk) in the benign period before 8/2007**
- **Very strong repricing since 8/2007: Higher risk and also uncertainty**
- **Overall: We capture some key features of subprime turmoil**