



**European  
Derivatives**  
GROUP

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**Market Transparency and  
Rating for Structured Products**

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*Structured Products Conference 2008, November 12<sup>th</sup>*

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## Funds

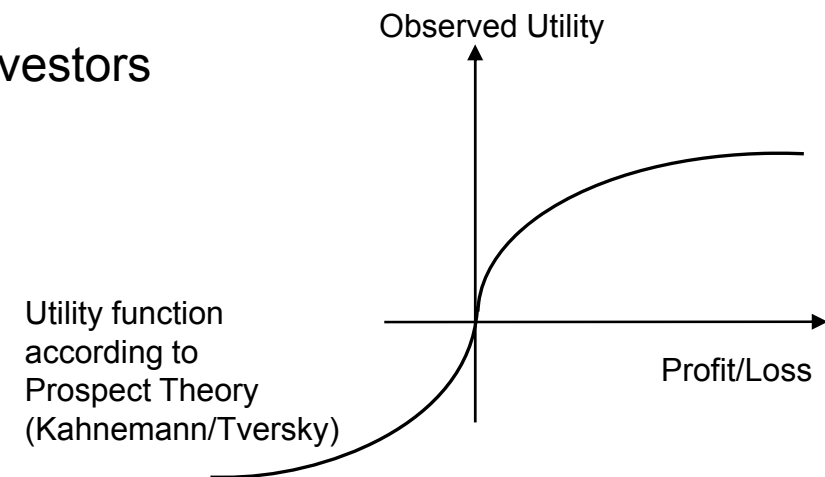
- 1950** Introduction of investment funds in Germany
- 1957** Law for Investment Management Firms
- 1970** Foundation of BVI Bundesverband Deutscher Investment-Gesellschaften e.V.
- 1974** Foundation of the European Fund and Asset Management Association (EFAMA) (FEFSI; since 2005: EFAMA)
- 1992** Morningstar Rating
- 1995** DVFA Program: Certified International Investment Analysts
- 2003** BVI-Code of Conduct
- 2004** Derivatives-Regulation demands risk calculation according to VaR
- 2007** Market volume in public funds €460 billion

## Structured Products

- 1995** First Discount-Certificate
- 2000** Market volume approximately €2 billion
- 2003/4** Foundation of Deutsches Derivate Institut and Derivate Forum
- 2005** Foundation of risk classification according to VaR
- 2006** Derivate Kodex
- 2007** Foundation of academies
- 2007** Market volume approximately €135 billion
- 2008** Foundation of Deutscher Derivate Verband, foundation of Europäische Zertifikateverband, introduction of VaR in Austria and Switzerland
- 2008** Introduction of Structured Product Ratings

# Risk Perception and Different Types of Structured Products

- Investors prefer worst-case-risk-avoiding investments after the crash of the years 2000-2003
  - Guarantee-Certificates
- Small losses are disproportionately painful for investors
  - Bonus-Certificates
  - Express-Certificates
  - Airbag-Certificates
- Expectation of decreasing volatility
  - Discount-Certificates
  - Bonus-Certificates



- Investors have individual risk preferences and perceptions
- Investing in Structured Products allows investors to match their specific risk-return profile

## **Structured Products....**

... facilitate tailored investments,

... are more complex and require a more intense advisory than classical investments

→ Major challenges for advisors and private investors:

Selection of suitable products based on proper product knowledge

## **Key Questions:**

1. What degree of transparency is required on Structured Product markets?

2. What is a Rating for Structured Products able to accomplish?

3. What can a dynamic risk classification achieve?

Initial Situation and Challenges

Dynamic Risk Classification (Value at Risk)

Structured Product Ratings

Application of Structured Product Ratings

Conclusion

# Risk Characteristics of Structured Products

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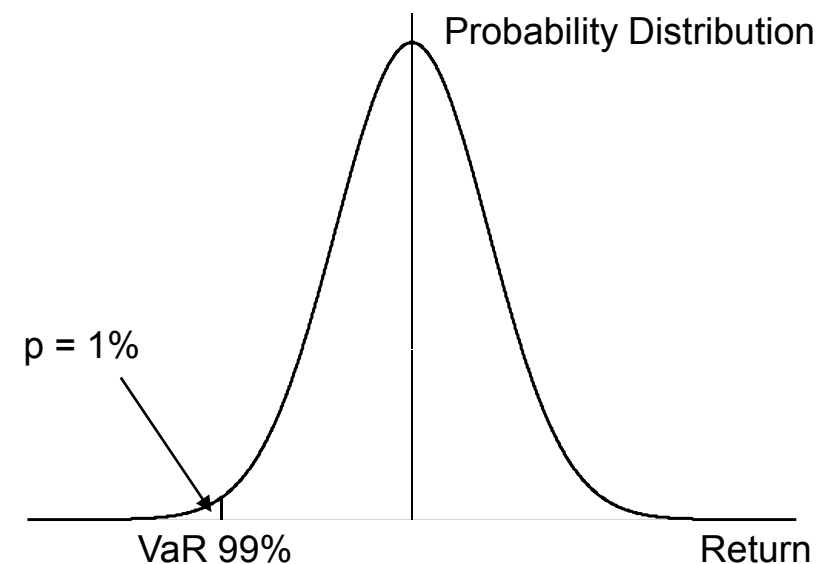
Risk of Structured Products depends on...

- Type of Structured Product (e.g. Outperformance vs. Guarantee-Certificates)
- Specification of the structure (e.g. location of the barrier-level)
- Underlying(s) (Volatility, Correlation in case of multiple underlyings)
- Maturity
- Currency risk
- Risk-free interest rate
- Creditworthiness of issuer

→ Risk is dynamic and can change during product's lifecycle

## Concept of Value at Risk

- VaR describes a risk of loss in Euro (or in %)
- It describes a loss that is only exceeded with a small probability
- The major three determining factors are:
  - Holding period (10 days)
  - Confidence level (99%)
  - Investment (€ 10,000)
- VaR is not a maximum loss!
- VaR indicates a certain point on the cumulative probability distribution of possible returns
- VaR can be applied to single- or multiple asset portfolios



## Translation of VaR into Risk Classes

- Determination of risk class-borders according to VaR for benchmark investments
- Estimated period of 5 years: observation of different market cycles with the goal of long-term stability of risk class-borders
- VaR is determined for investments of €10,000

Risk Class	Borders in EUR	Benchmarks	Investor Type
1	$0 < \text{VaR} \leq 250$	Bond Indices (1 - 5 years)	conservative
2	$250 < \text{VaR} \leq 750$	Gold Spot, i.Boxx Europe, EMU Bond Index	moderately conservative
3	$750 < \text{VaR} \leq 1,250$	ATX, DAX, DJ EuroStoxx 50, Dow Jones, S&P 500	moderate
4	$1,250 < \text{VaR} \leq 1,750$	Index-members (Average)	moderately aggressive
5	$1,750 < \text{VaR} \leq 10,000$	Volatile small-cap stocks (e.g. Solar stocks)	aggressive

## VaR-Values for Example Products

- Structures based on the Euro Stoxx 50

Product	VaR	Risk Class	Maturity	ISIN
Deep Discount (Cap 2250)	<b>99</b>	1	01/2010	AT0000439039
Discount (Cap 4300)	<b>661</b>	2	07/2008	AT000B053400
Euro Stoxx 50 (Underlying)	<b>768</b>	3		
Bonus (Barrier 2163.87, bonus-level 5700.97)	<b>776</b>	3	08/2012	AT0000A060R0
Outperformance (Strike 2958.61, participation 170%)	<b>1331</b>	4	07/2008	DE000DB0G226
Optionsschein (Call, strike 3500)	<b>2327</b>	5	12/2009	DE000DB4W274

As of 01.02.2008  
EStoxx: 3.867

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## Illustration of Dynamic Risk Evaluation

## Scenario Simulation – Price- and Risk-Behavior

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### Question:

How does the price and the risk of a Structured Product react over its lifecycle due to different market scenarios?

- Exemplary simulation for offensive Bonus-Certificate
- Comparison with adequate Index-Certificates
- Assumption of 3 market scenarios for changes in underlying price
  - Decreasing
  - Sideways
  - Increasing

→ Follow up question:

At which time of its lifecycle is a Structured Product appropriate for a specific investor type?

**Folie 11**

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**RH27**

**October --> November**

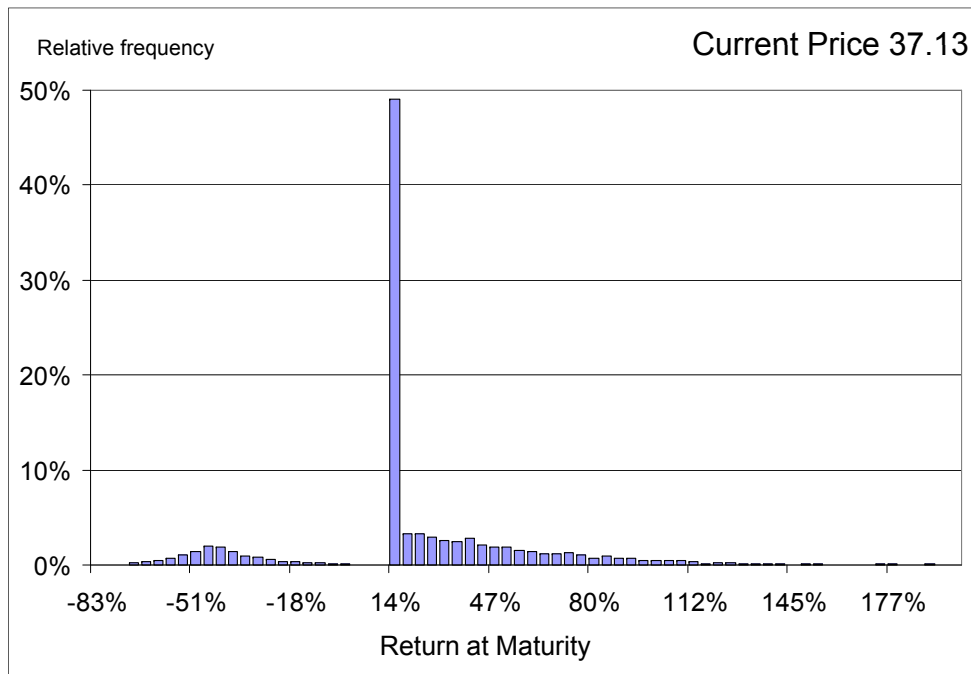
Richard Hector; 29.10.2008

# Investment Strategy – Comparison Offensive vs. Defensive

- Comparison of two Bonus-Certificates based on the Euro Stoxx 50 Price Index

## Defensive Strategy: Cushion of 46.2%

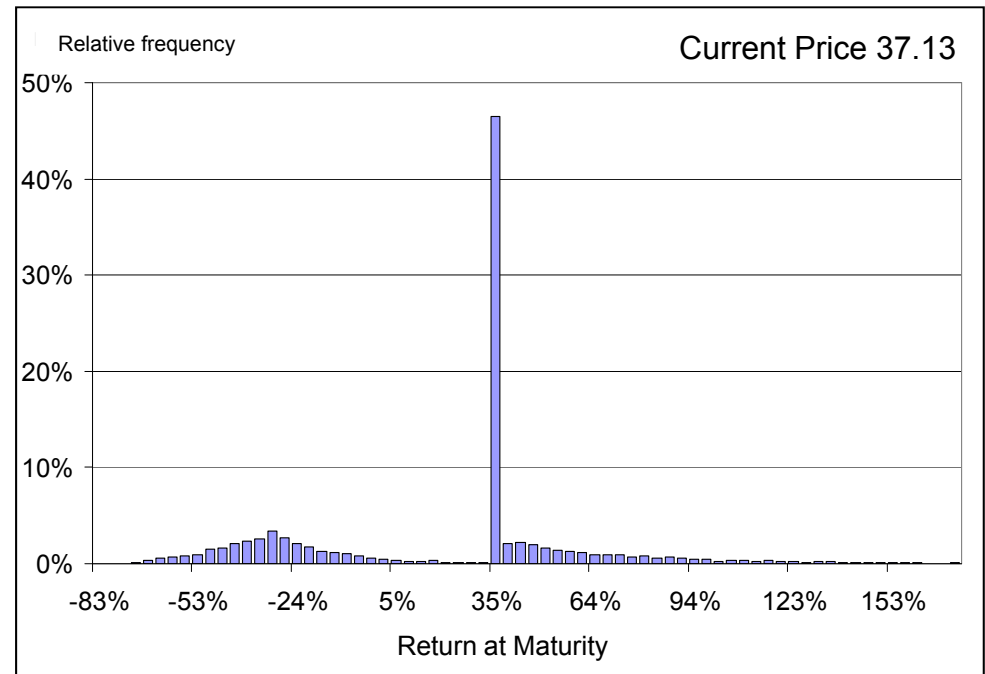
(Barrier 2000, Bonus-Level 4250, Maturity 4 years)



As of 15.2.2008  
Price of underlying 3719.28

## Offensive Strategy: Cushion of 32.8%

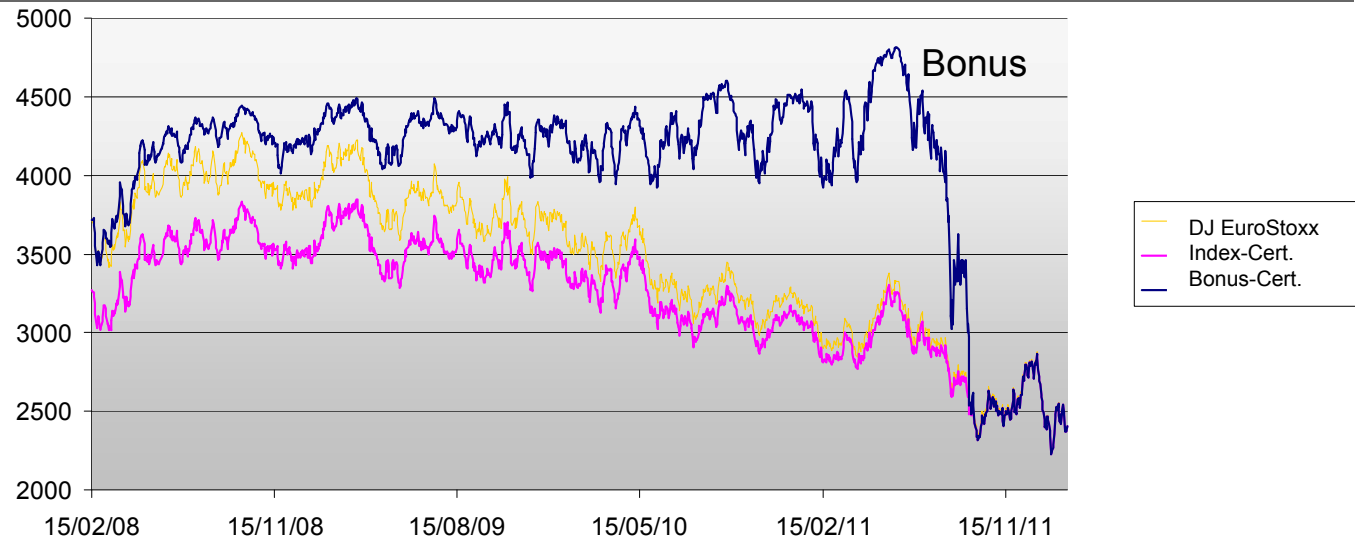
(Barrier 2500, Bonus-Level 5000, Maturity 4 years)



# Simulation – Decreasing Market

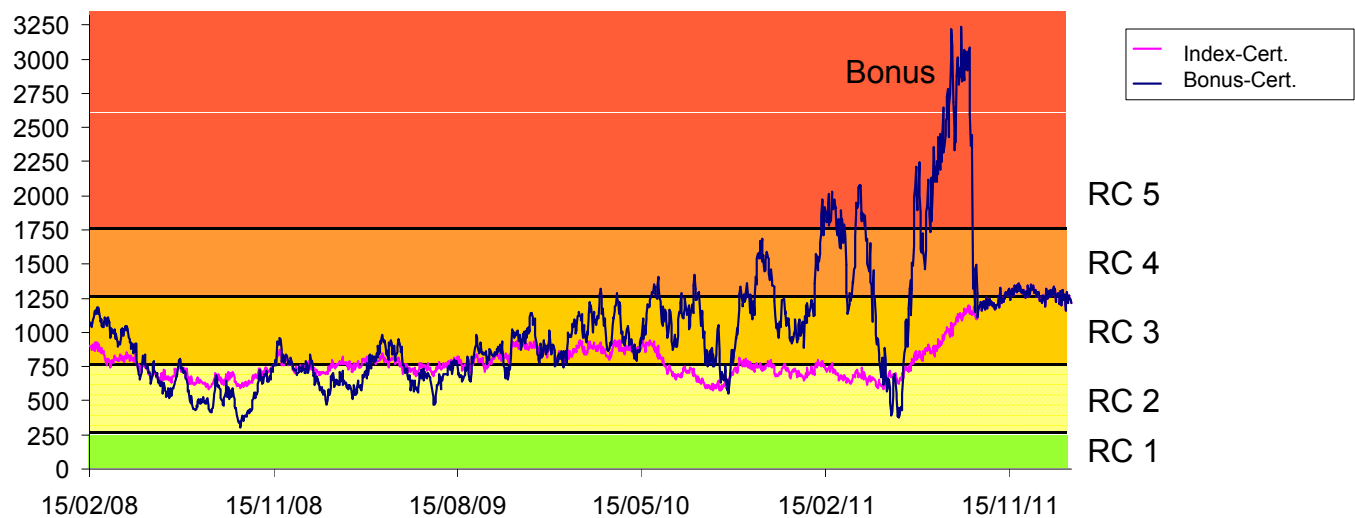
## Price-change over time

- Bonus-Cert. initially positive
- Collapsing close to the barrier
- - 52% Bonus vs. - 30% Index during 06/2011 – 10/2011



## Risk-change over time

- Bonus-Cert. initially in Risk Class 2-3 (RC 2-3)
- Risk increasing considerably before collapse
- Enormous risk fluctuation
- After breaking the barrier, risk is identical to underlying



Initial Situation and Challenges

Dynamic Risk Classification (Value at Risk)

Structured Product Ratings

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Conclusion

1. **Quality assessment** (independent, i.e. no estimation about underlying or product structure) for each product based on the four criteria:
  - Costs
  - Trading
  - Creditworthiness
  - Information Availability
2. Risk-return assessment (**risk-fit**) for each product depending on investor-specific risk preferences
3. Addition of quality assessment and risk-fit to an **overall grade** about the suitability of the product

## Example Cost

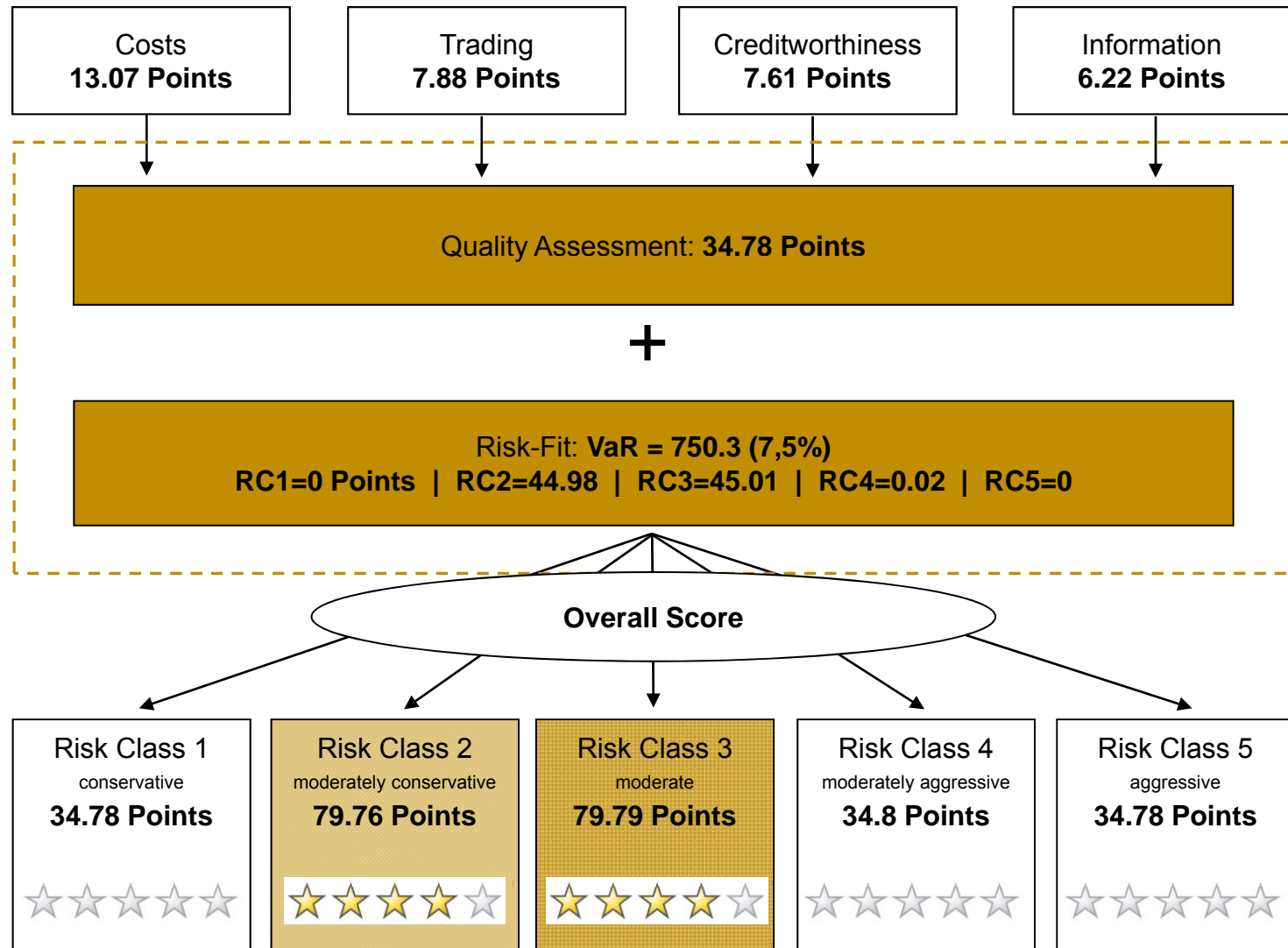
Illustration of cost scores for five Discount-Certificates based on Deutsche Bank

	Maturity	Cap	Mid – Quote	Rank	Model price	Diff. Model-Price in bps	Score	Rank
Product 1	2009-09-18	95	66.07	4	66.23	-24.25	13.98	1
Product 2	2009-12-18	95	65.39	1	65.54	-23.23	13.82	2
Product 3	2009-12-17	95	65.85	2	65.55	+45.85	3.10	5
Product 4	2009-12-18	100	66.29	5	66.18	+16.33	7.68	4
Product 5	2009-12-18	100	66.05	3	66.18	-19.93	13.31	3
Product 6	2009-12-17	100	66.80	6	66.16	+95.52	0.00	6

Valuation- and quote time: 05.15.2008, 11:44 a.m.

# Rating Example

**PROTECT-DISCOUNT**  
**Underlying: TOTAL**  
**Cap: 63.500 EUR**  
**Barrier: 42.000 EUR**  
**Maturity: 09.12.2008**  
**Share price: 55.87**



## Participating Banks:

- ABN Amro
- BNP Paribas
- Deutsche Bank
- Dresdner Bank
- DZ Bank
- Hypovereinsbank (Unicredit)
- Goldman Sachs
- Sal. Oppenheim
- West LB
- WGZ Bank

## Distribution:

- Onvista
- Finanztreff  
→ Spiegel / AOL / ...
- Scoach
- S-Broker
- Börse Online
- IDMS
- zertifikateweb.de
- zertifikatesuche.de
- Issuers websites

## EDG-Approach: Advantages and Disadvantages

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- “Real” Rating with numerous market-relevant factors included
- Consideration of investor types
- Uniform, standardised and objective approach for all products
- Consideration of implicit cost due to complete revaluation of products
- No “end of maturity” evaluation
- High product coverage

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- Complex model  
→ High calculation intensity
- Due to missing data no inclusion of “off-times” in trading criterion
- Consulting quality not included  
(assessment may be subjective)

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## Investors / Financial Advisors

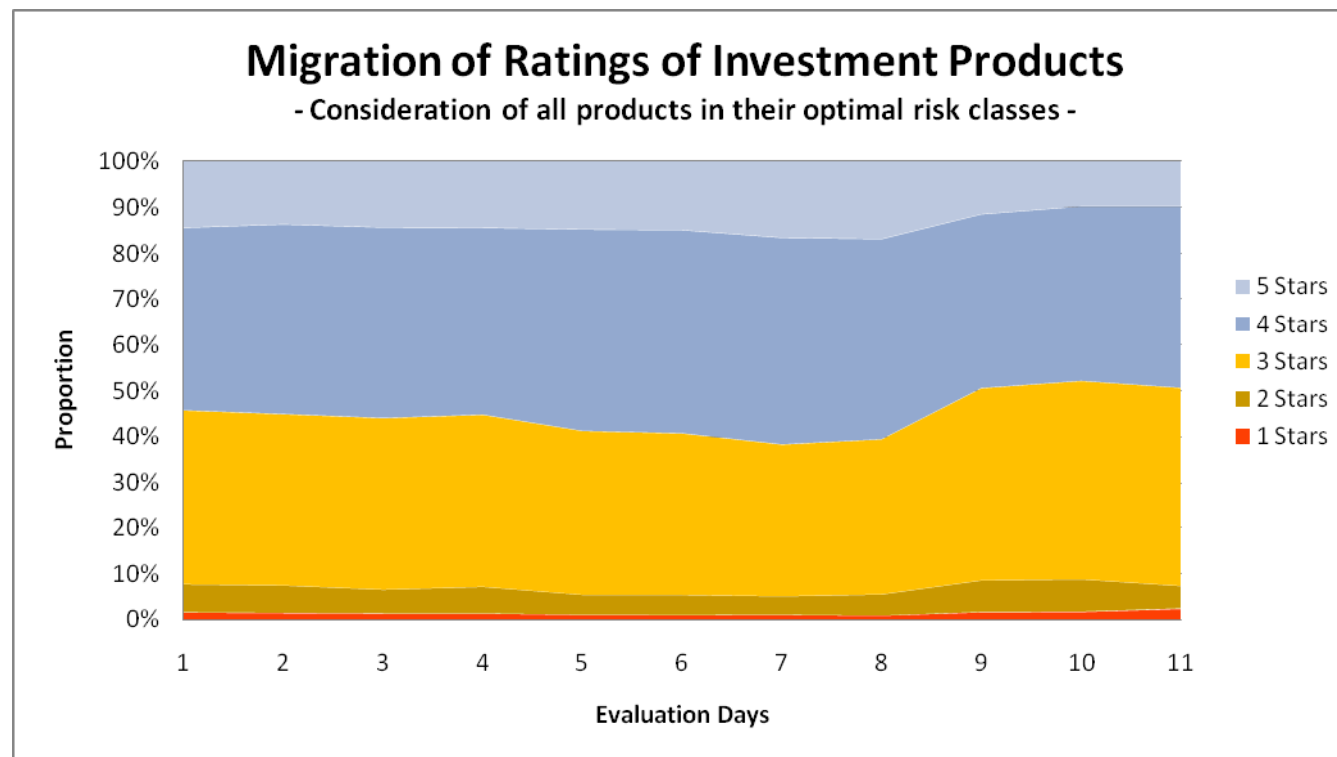
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- Limitation of product and consulting universe
  - Focus on products with „excellent“ rating
- Support for advisors by providing an objective, independent badge of excellence
- Customer / investor can be informed about product quality during product's lifecycle
- Consulting in accordance with MiFID-Regulations
  - Rating delivers recognizable value-added for advised customers
- Continuous monitoring of acquired products over its lifetime
- Competition among Structured Product issuers is increasing

**Conclusion** A product rating simplifies advisory in the complex Structured Product market and reduces legal risks due to bad advice

# Rating-Migration

- Presentation of all products in their respective optimal risk classes
- Recognizable improvements of issuers after just a few weeks
- Decrease of rating results due to worse creditworthiness (higher credit spreads) in the current market environment



Initial Situation and Challenges

Dynamic Risk Classification (Value at Risk)

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## Conclusion

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- Complex products require proper advisory and high qualification
  - Dynamic risk structure has to be recognized and mediated
  - Transparent clarification of issuer's default risk
  - Selection of suitable products for investors
  
- Structured Product ratings and risk classification are important facilities
  - Dynamic risk classification (DDV) explains the variability of risks for different products and structures
  - Profound rating provides added value to investors and advisors
    - No general preference for a specified structure or underlying
    - Consideration of all market-relevant factors, e.g. creditworthiness, cost, trading and information
  
- Future challenges
  - Establishment of transparency standards for further markets
  - Backtesting of ratings

## Contact Details

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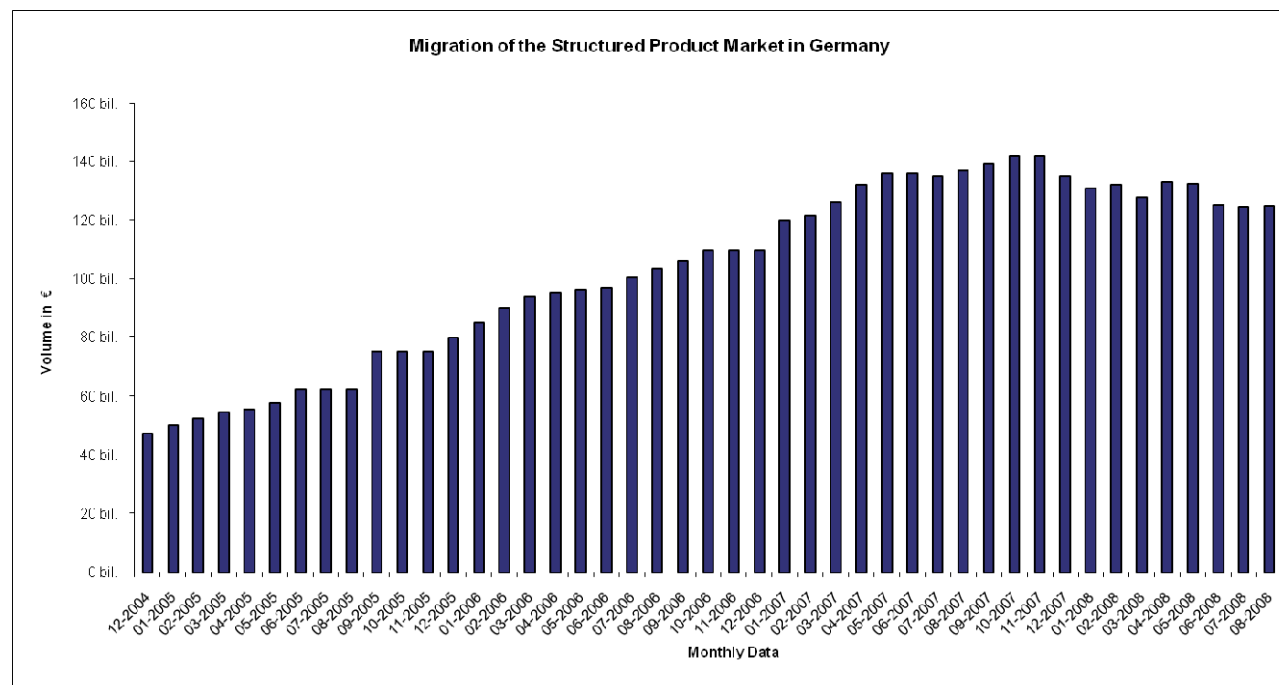
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## Appendix: Size and Dynamic of the Market in Germany

- 2000: Volume of Structured Products approximately €2 billion
- Structured Products market has grown dynamically and continuously over the last couple of years
- Volume outstanding from January 2005 till December 2007 has more than tripled
- Market volume in Germany in July 2008: app. €125 billion
- Due to current market conditions a strong decline in 2008 is expected



Source: DDV, monthly statistics Jan. 2005 until Jul. 2008

## Methodological Requirements

- Objective and understandable risk evaluation
- Comparability (all investment vehicles, all issuers)
- Coverage of specifications of Structured Products (e.g. non-linear payoff profiles)
- Consideration of partial risks (quote-, interest-, currency-, volatility- and issuer risk)

## Regulatory requirements

- MiFID Art. 19.3 – Providing proper information for product risks
- Value at Risk (VaR) is regulatory standard for institutional investors

- Application of VaR for classification of Structured Products
- Classification to risk classes for better understanding

## Appendix: Value at Risk as Financial Market Standard

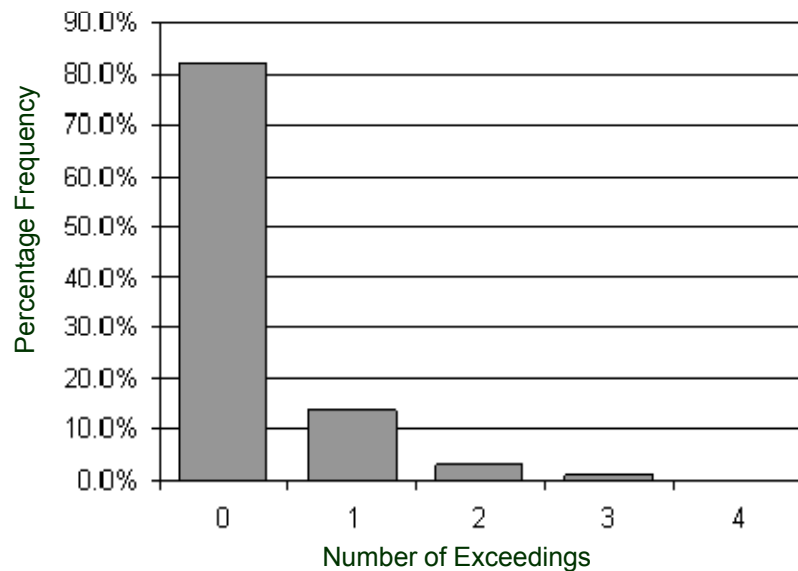
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- 1993 Global Derivatives Study Group recommends VaR for derivatives business
- 1994 J.P. Morgan RiskMetrics publishes a detailed process for calculating VaR
- 1996 Basler Ausschuss für Bankenaufsicht recommends VaR for risk evaluation in trading books
- 2004 Derivateverordnung recommends VaR for Funds trading derivatives
- 2005 Derivate Forum introduces risk classification for Structured Products based on VaR
- 2005 Basel II recommends VaR operational risk and credit risk
- 2007 Solvency II recommends VaR for insurance businesses

→ VaR is well established in the institutional sector

## Appendix: Validation of Methodology – Backtesting

Distribution of number of products with 0 – 4 exceedings  
April 2006 – April 2007



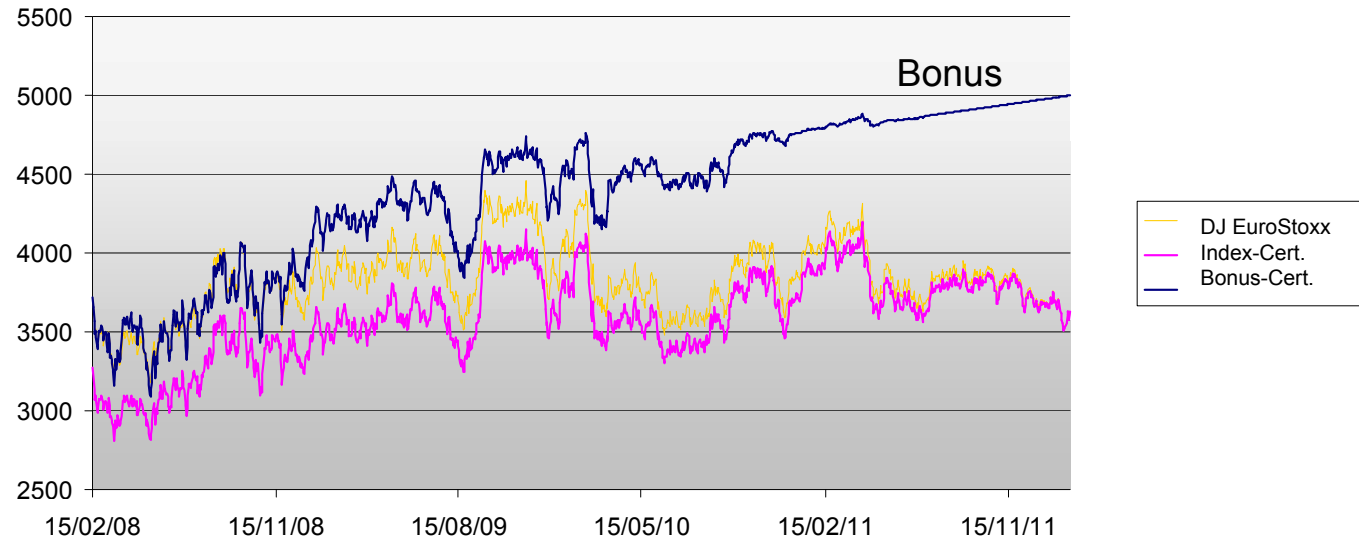
- Verification of 8,157 products during the period of April 2006 to April 2007
- A total of 191,991 observations were analyzed, while 1,990 exceedings were observed

Consequently, a 99% accuracy for the VaR estimations is given

# Appendix: Simulation – Sideways Scenario

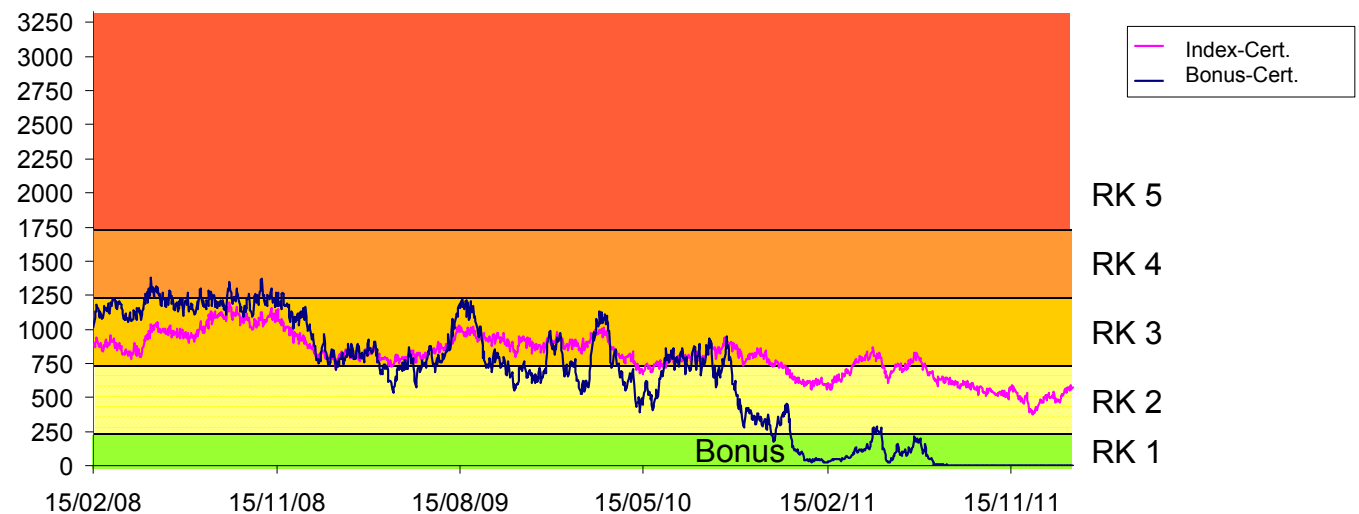
## Price-changes over time

- Perfect Market conditions for Bonus products
- +35% Bonus vs. 0% Index (10% Index-Cert. including Dividends)



## Risk-changes over time

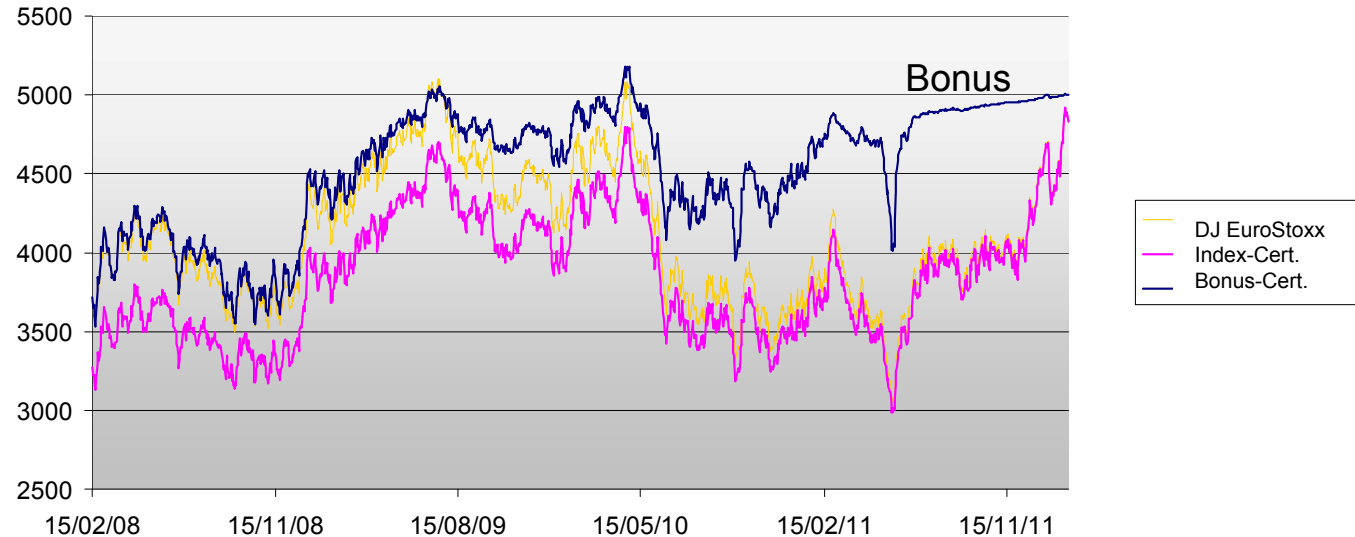
- Bonus-Cert. initially in RC 3
- Risk falls with increasing distance to the barrier
- Close to maturity solely a bond-like product, no price risk



# Appendix: Simulation – Increasing Market

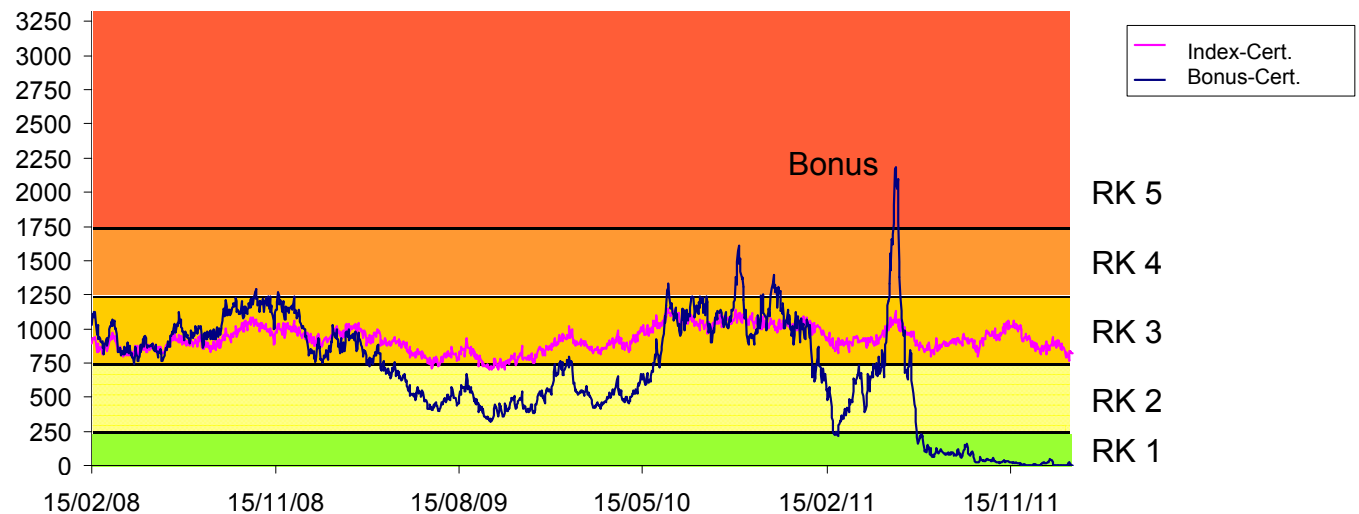
## Price-changes over time

- Similar performance of Bonus-Cert. and Index
- But no dividends
- In case underlying > Bonus-level, Bonus-Cert. has a downside protection

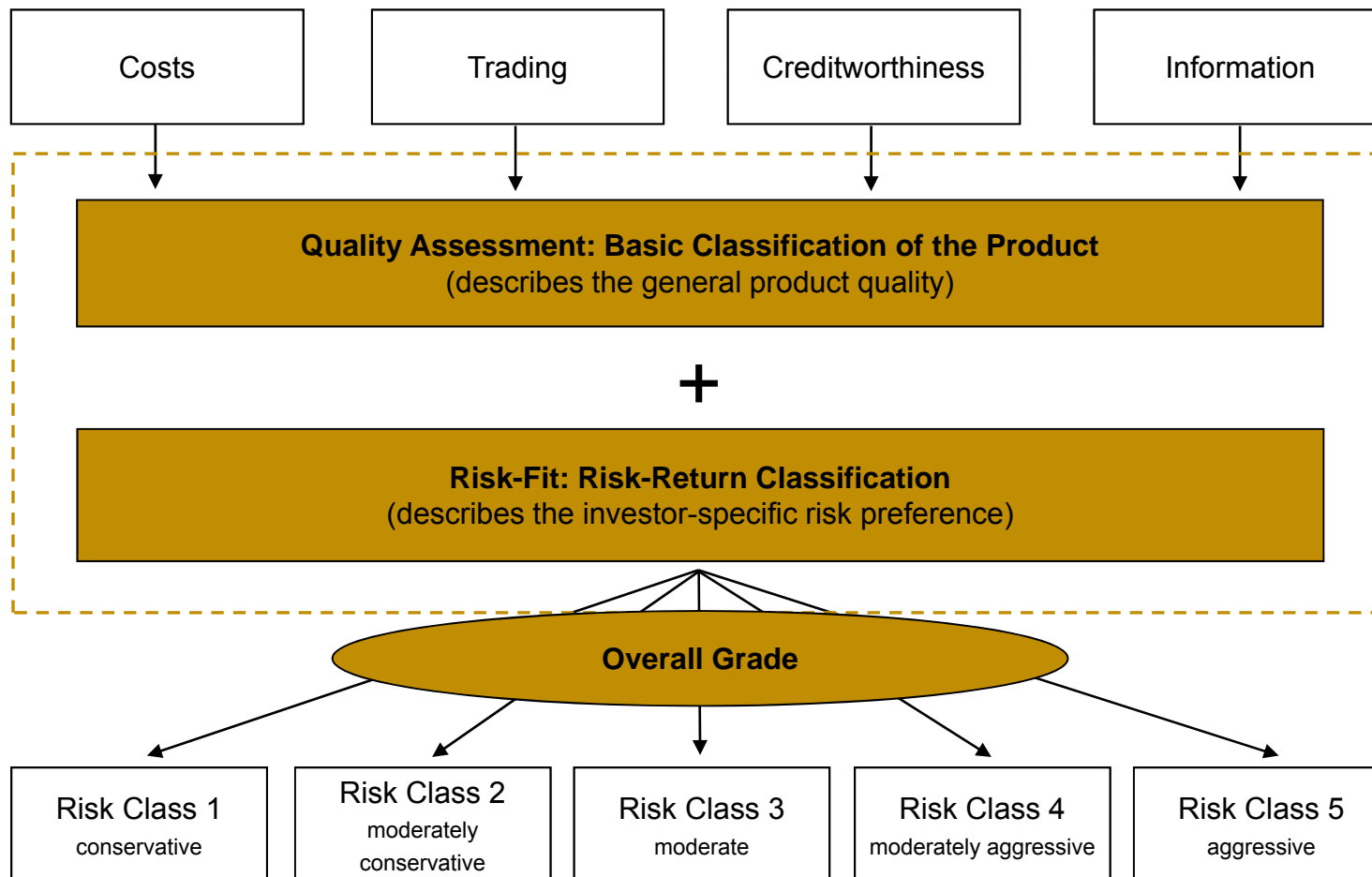


## Risk-changes over time

- Bonus-Cert. initially in RC 2-3
- Risk increase for a short period of time when underlying narrows the barrier
- Significant increase of risk in 05/2011. Downside peak of underlying comes along with increasing volatility



# Appendix: Conceptual Overview



## Appendix: Rating Results - Stars

- Scale from zero to five stars
- Grade for each product assuming five risk perspectives
- Highest rating in optimal risk class

### Illustration



### The product obtains the assessment ...

...not suitable

...hardly suitable

...below average

...average

...good

...excellent

# Appendix: Methodology and Criteria

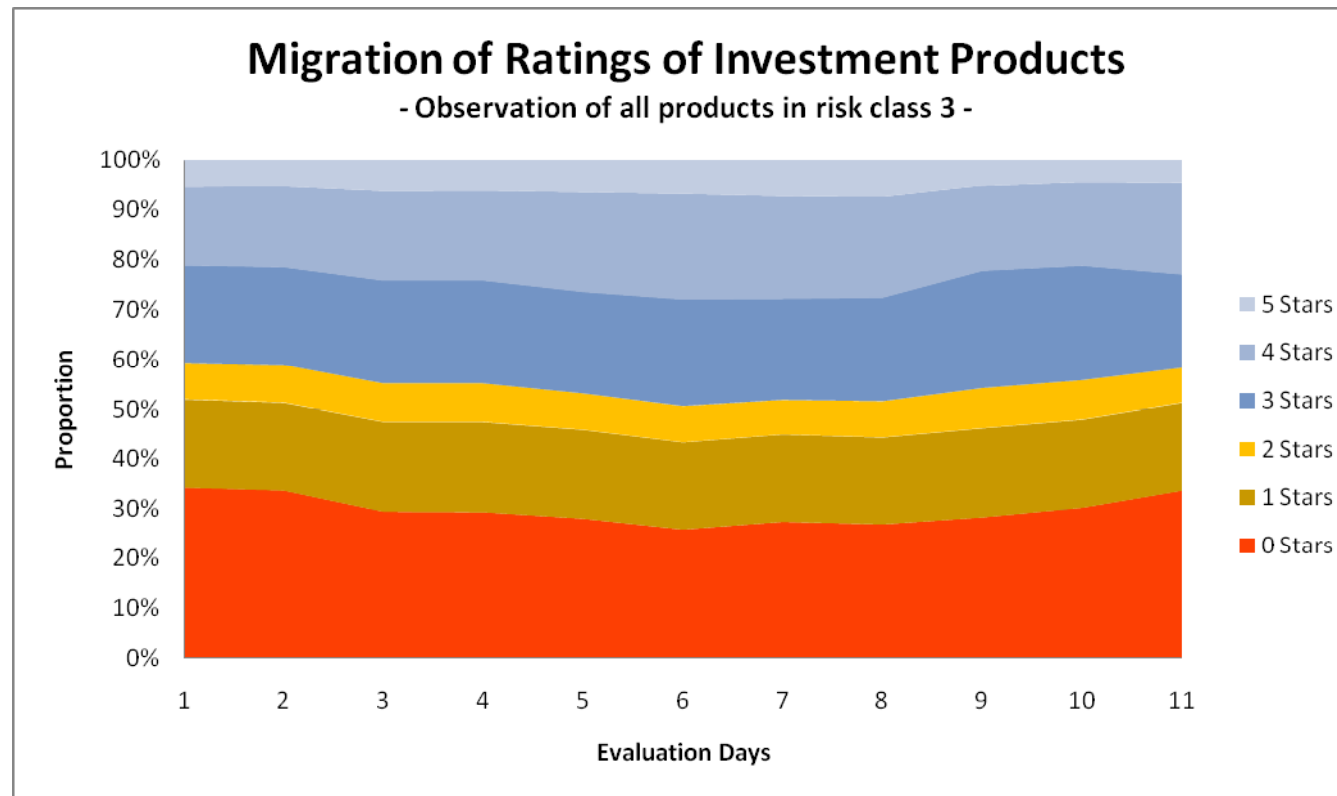
Product Rating					
Weight*	20%	10/20%	10/5%	10/5%	50%
	<b>Costs</b>	<b>Trading</b>	<b>Creditworthiness</b>	<b>Information Availability</b>	<b>Risk – Return (risk-fit)</b>
	<p><b>Relative price comparisons within product groups</b></p> <ul style="list-style-type: none"> <li>→ Assessment of price differences to own benchmark price</li> <li>→ Average costs are conceded to each product</li> </ul>	<p><b>Evaluation of bid-ask-spread and execution performance (50% each)</b></p> <ul style="list-style-type: none"> <li>→ Spread analysis per product</li> <li>→ Execution speed per product category (exchange data)</li> </ul>	<p><b>Assessment of Issuer’s credit spreads (rating)</b></p> <ul style="list-style-type: none"> <li>→ Evaluation of credit spreads if available, alternatively mapping via credit rating</li> <li>→ important criterion for broad public acceptance</li> </ul>	<p><b>Questionnaire-based survey using test persons</b></p> <ul style="list-style-type: none"> <li>→ Assessment of online available information for each issuer</li> <li>→ Check for compliance with Derivate Kodex (derivatives code)</li> </ul>	<p><b>Scores derived from return distribution</b></p> <ul style="list-style-type: none"> <li>→ suitability depends on investor’s needs and preferences</li> <li>→ Assessment of each product for five risk classes</li> </ul>
<b>Conclusion</b>	The rating includes a <b>quality assessment</b> as well as a <b>narrowing down</b> of the products relevant for each specific investor				

\* Weight for investment products / leverage products

## Appendix: Rating-Migration (II)

### Illustration of all products in risk class 3

- Large number of products not suitable (for risk class 3)
- Large proportion of „0-star“-products due to missing risk-fit



## Appendix: Benefits for Issuers (Structured Products rating)

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- Increase of acceptance and transparency of Structured Products
- Information tool for (potential) customers / investors and sales people
- Recruitment of new investors
- Increased trading through potential portfolio restructuring due to changes in ratings
- Stronger customer relationship

**Conclusion** Product rating simplifies informing (potential) customers as well as sales partners and allows increasing market share while maintaining a portfolio of high quality products

## Appendix: Backtesting of Structured Products Rating

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### Does a Rating for Structured Products provide prediction power?

- Analyses for Structured Products require longer observation horizons (historical results of EDG-Rating are available from June 2008)
- Analyses for fund ratings are already available
  - Ratings are used for individual investment decisions
  - Excellent rating leads to higher fund-flows
  - Prediction power for future returns is low or not existent

### Conclusion

- Funds ratings provide only limited forecasting ability
- Rating model for Structured Products is different (no ex-post performance analyses)
- Sustainable Structured-Product-Rating ought to prove prediction power