Global Association of Risk Professionals

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April 2008

GARP
GLOBAL ASSOCIATION OF RISK PROFESSIONALS

- Introduction to GARP
- Risk management as a career
- GARP's resources

GARP HIGHLIGHTS

Our Core Vision

To build greater confidence in the global financial system.

Our Mission Statement

To be the leading professional association for risk managers, managed by and for its members dedicated to the advancement of the risk profession through education, training and the promotion of best practices globally.

- Not-for-profit independent association
- Over 69,000 members worldwide from more than 167 countries
- Members represent over 5,000 different companies, including banks, asset management firms, insurers, academic institutions, government regulatory bodies, and other financial institutions
- Developing standards around the world through our FRM® program and GARP Risk Academy
- Practice-oriented
- Offices in greater New York City and London
  - Expanding in Asia

Helping the financial risk management community make a difference in the world.

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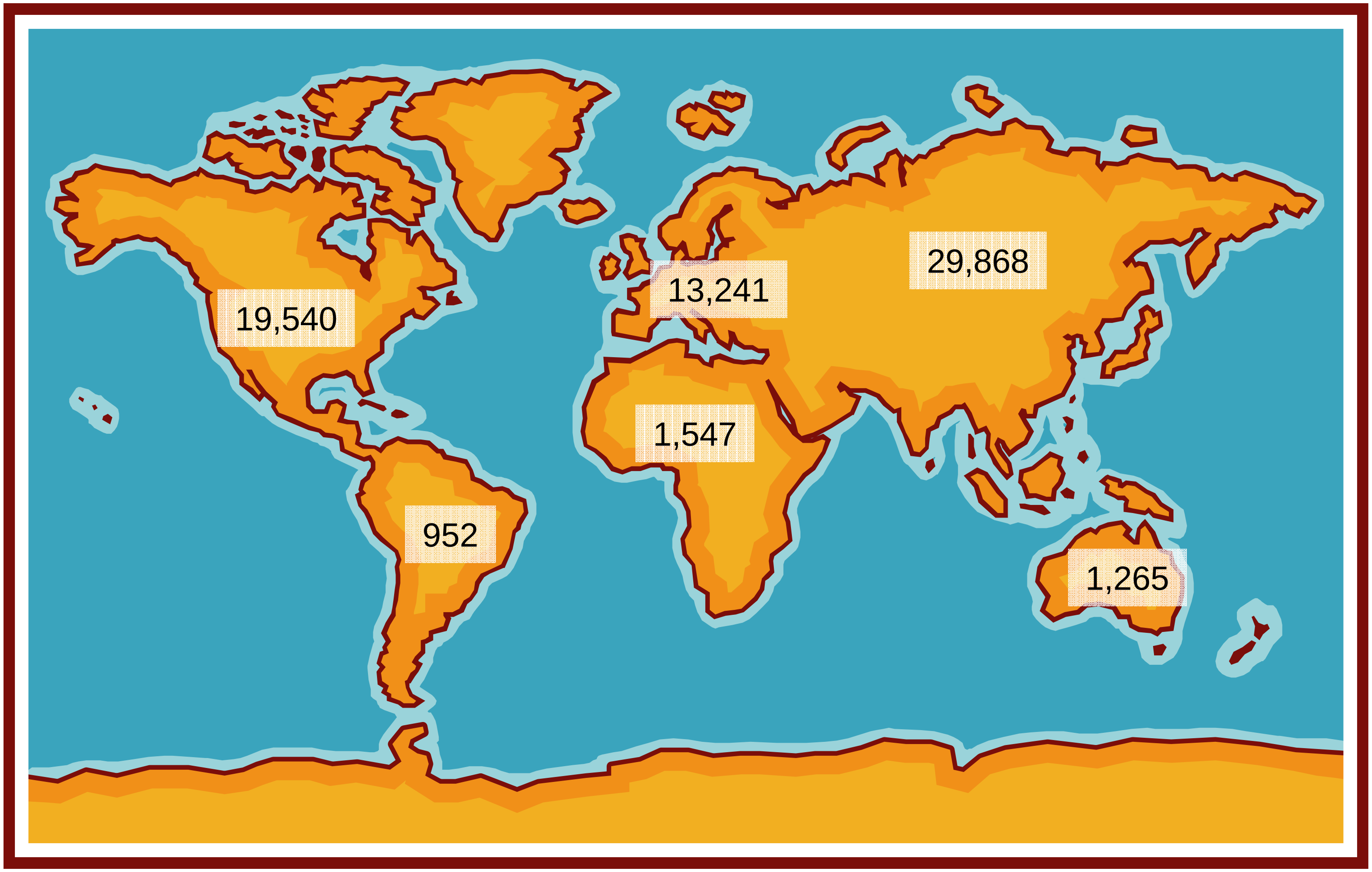
GARP AROUND THE WORLD

Our members are in 167 countries on six different continents.



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GARP BOARD OF TRUSTEES

Active involvement from some of the world's most renowned financial risk management professionals in the academic and corporate sectors.

Name	Position	Company
Richard Apostolik	President and CEO	GARP
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Riccardo Rebonato	Head, Global Market Risk	Royal Bank of Scotland Group
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David Shimko	Principal	Towers-Perrin Risk Capital
René Stulz	Everett D. Reese Chair, Banking and Monetary Economics	The Ohio State University
Peter Tufano	The Sylvan Coleman Professor of Financial Management	Harvard University
Mark Wallace	Managing Director, Global Strategic Projects	Credit Suisse

RISK MANAGEMENT FUNCTIONS

- Measure risk
  - Developing methods to measure risk
  - Position data and risk modeling
- Monitor risk
  - Developing systems to monitor risk
  - Timely risk reporting and dialogue
- Manage risk
  - Developing strategies to manage risk
    - Applying financial risk management tools to reduce exposures
  - Risk budgeting and risk limits
  - Hedging and eliminating risks

Central Tenets of Risk Management

- Risk-taking is fundamental to financial intermediation and economic development
- Effectively managing risks associated with a business is a critical and intrinsic responsibility of management
- Objectives of risk-taking
  - Active
  - Prudent
  - Balanced (across asset classes, types, businesses, etc.)
  - Commensurate with potential rewards and firm's risk appetite
- To be effective, risk managers must have credibility and access to senior management and all aspects of firm (front office, back office)
- Effective risk management requires an integrated approach
  - Spans all risk exposures
  - Culture of risk awareness throughout the organization

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Central Tenets of Risk Management

- Risk management is not risk avoidance
- Risk management must ensure that management is fully informed about the risk profile of the firm
- Risk management must protect the firm against unacceptably large losses

NO SURPRISES!

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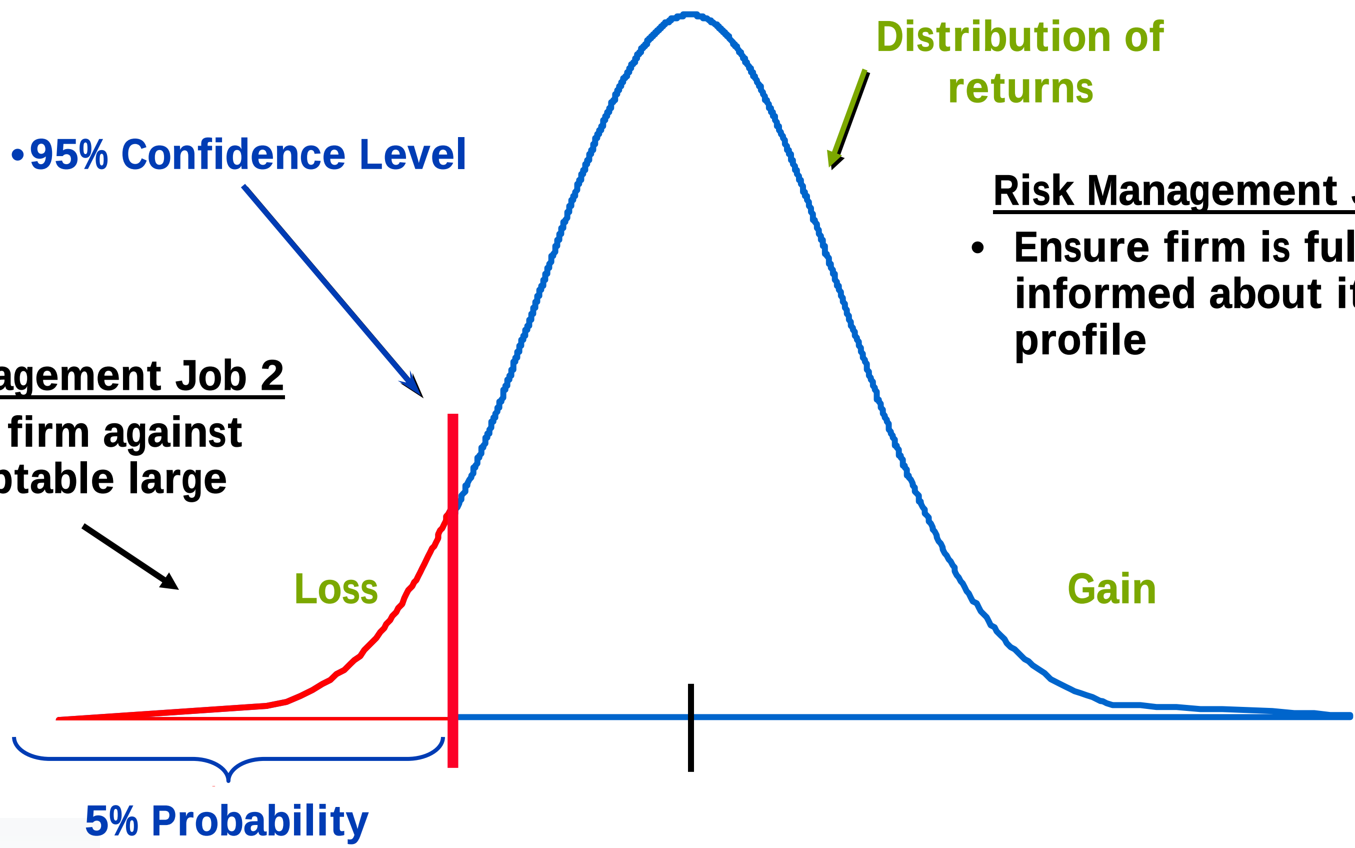
Risk Management - Graphically



Risk Management Job 1

- **Ensure firm is fully informed about its risk profile**

Risk Management Job 2

- **Protect firm against unacceptable large losses**

Measuring and Communicating Risk

- No one summary measure or statistic exists for any category of risk
  - "So far as the laws of mathematics refer to reality, they are not certain. And so far as they are certain, they do not refer to reality" – Einstein
  - Risk reports must include multiple measures to highlight risk profile
- Risk monitoring and reporting
  - Review positions and changes in risk profile
  - Measure exposure sensitivity to changing market conditions
    - Scenario analysis and stress testing
  - Identify risk limit under- and over-usages
- Risk dialogue and communication
  - Daily discussion with trading desk, daily risk reports
  - Weekly summary reports and risk committee meetings
  - Quarterly and annual risk reviews and regulatory reporting

Types of Risk

- Credit Risk
  - Possibility of losses due to default by a creditor or unexpected changes in credit quality of counterparty or issuer
  - Example: Loan default (mortgage, car loan, bond)
- Market Risk
  - Possibility of loss due to unexpected changes in market prices
  - Equity risk, interest rate risk, currency risk, commodity risk
  - Example: Interest rates rise → bond prices fall
  - Example: Aug-Sept 1998 – Russian ruble value dropped from 6:$1 to 16:$1
- Operational Risk
  - Possibility of losses due to inadequate or failed internal processes, people and systems, or from external events
  - System risk (technology, model), people risk (fraud, human error), terror risk
  - Example: System failure/fraud (Allied Irish Bank, Societe Generale)

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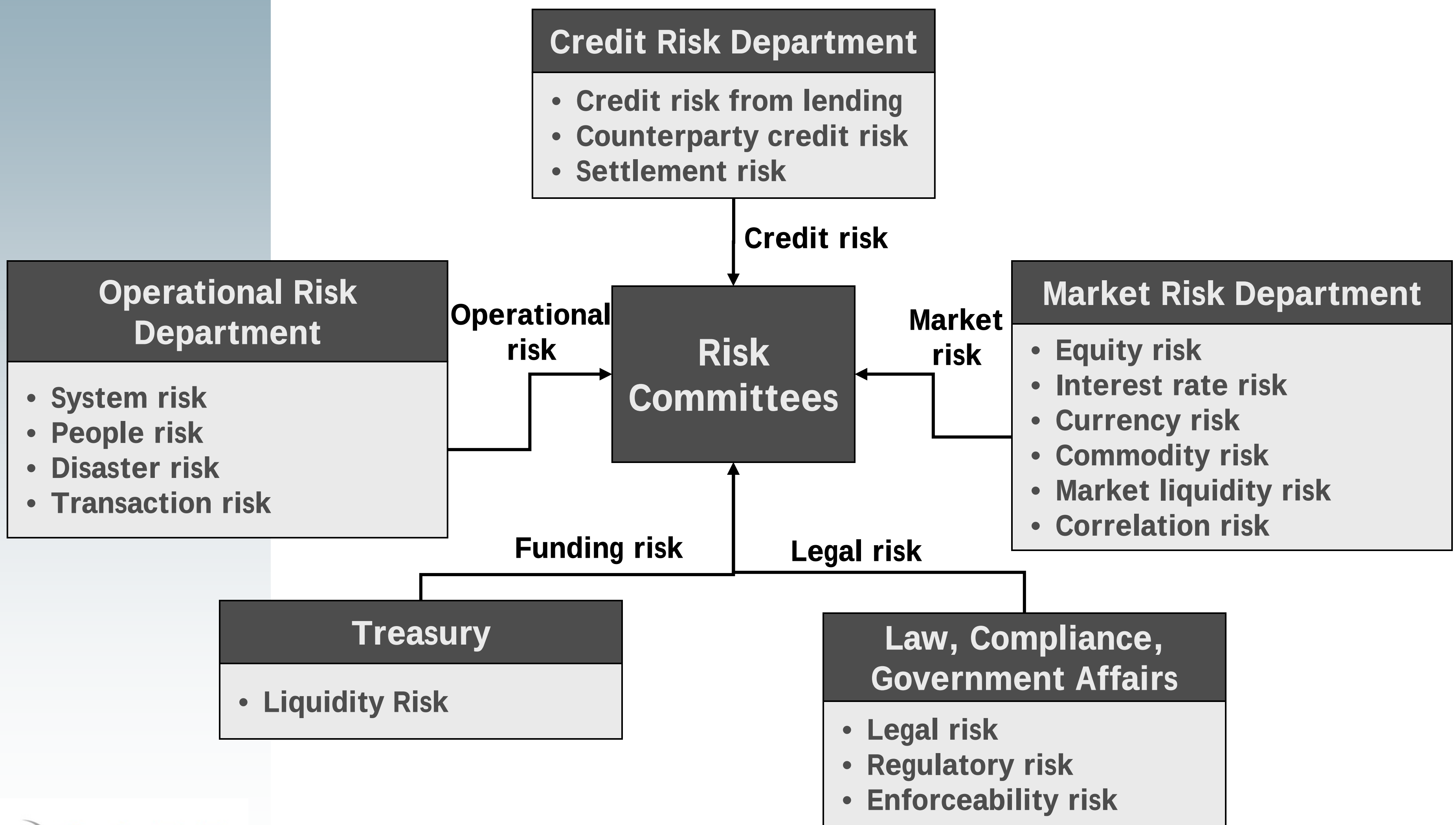
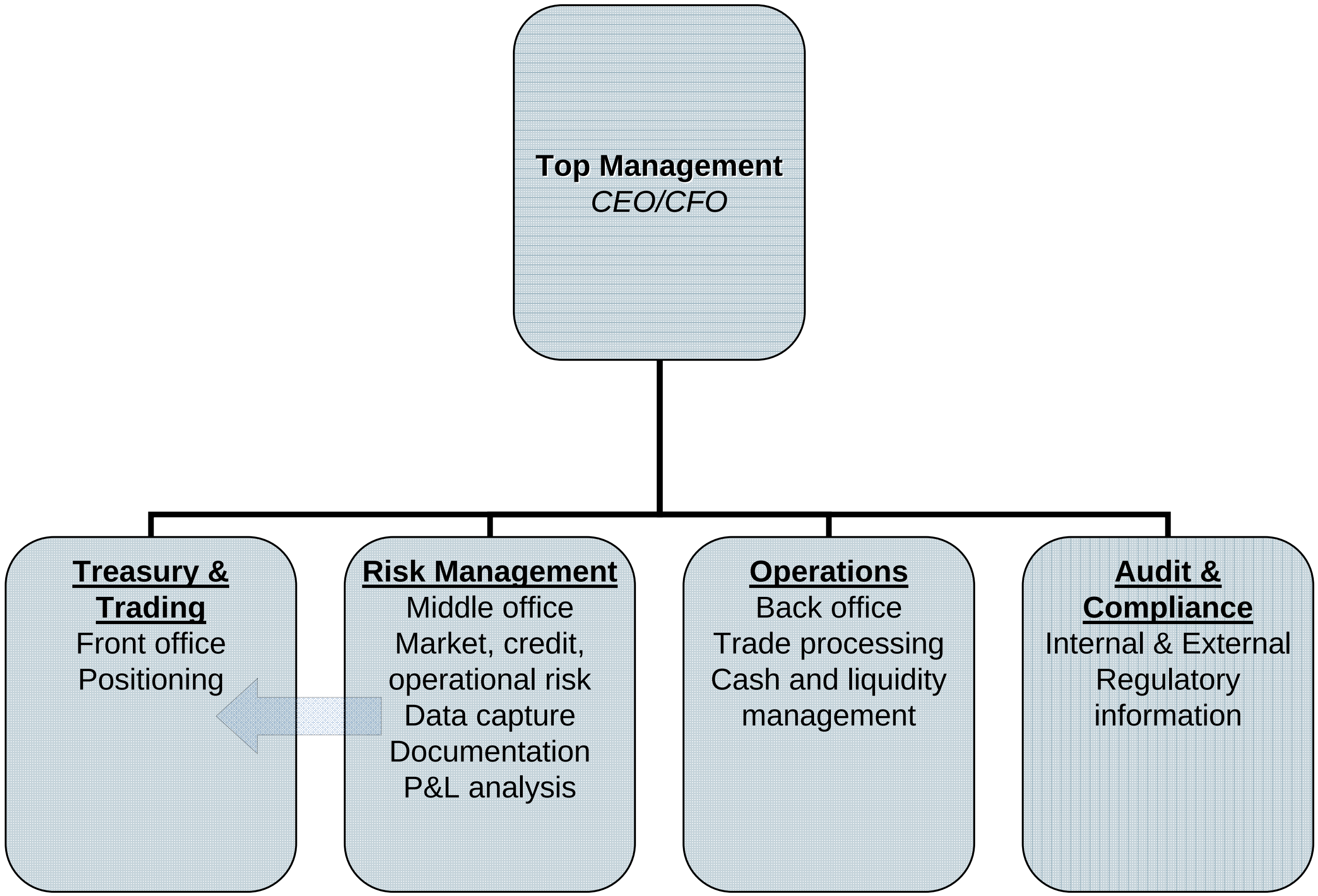
Risk Oversight Framework



RISK MANAGEMENT IN THE ORGANIZATION



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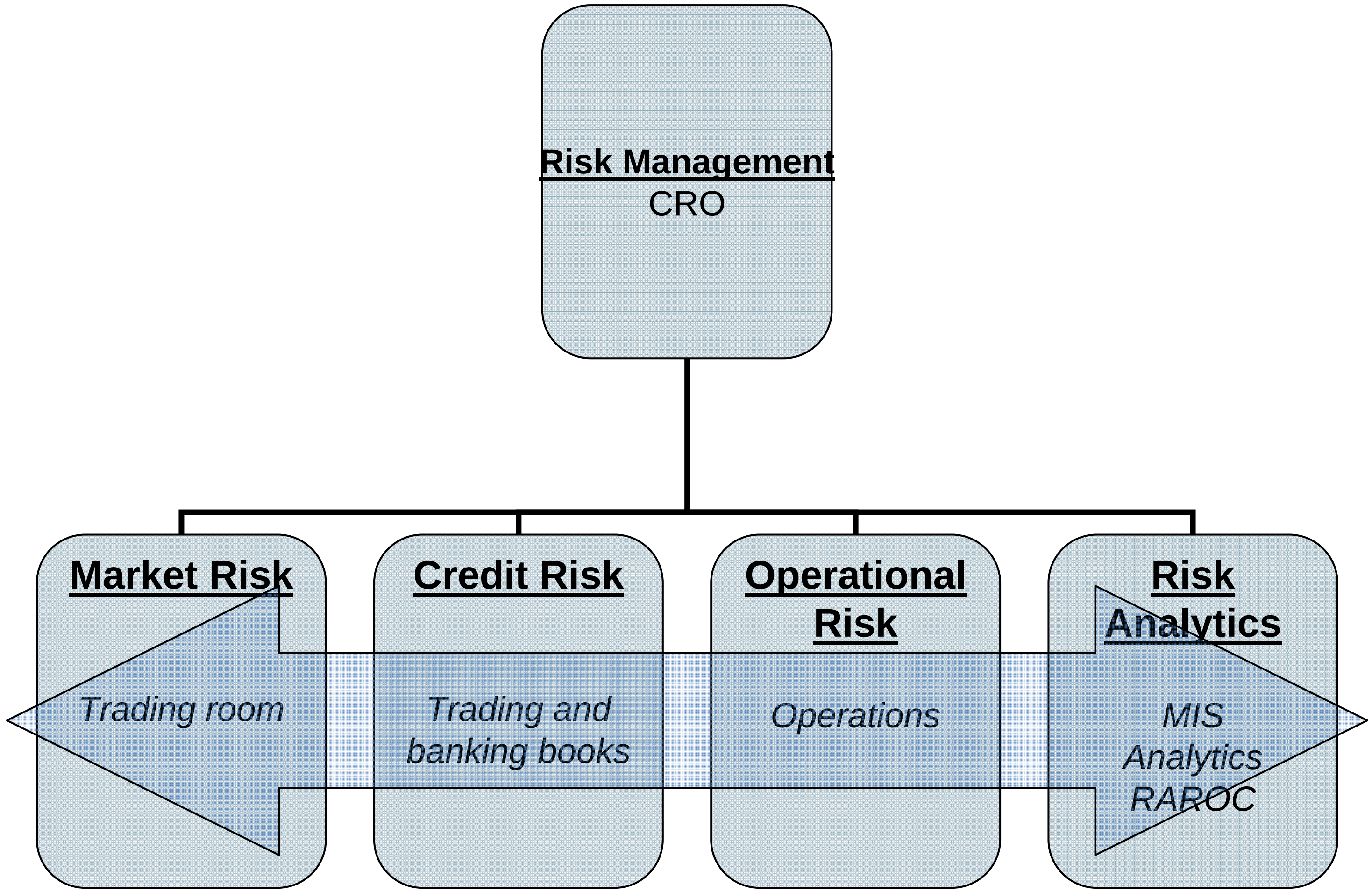
THE ORGANIZATION OF RISK MANAGEMENT FUNCTION



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RISK MANAGEMENT PROFESSION

- Risk management as a profession barely existed 20 years ago
- Considerable growth in past 15 years
  - Notable risk management failures
    - U.S. Thrift/S&L crisis, 1990s
    - Barings Bank, 1995
    - Long Term Capital Management, Bankers Trust, 1998
    - Current credit crisis, 2007
    - Société Générale, 2008
  - Risk measurement techniques
    - Late 80's – early 90's – JP Morgan developed Value-at-Risk to quantify expected loss
  - International Banking Regulation
    - Basel (1988), Basel II (2004) Accords
  - Buy-Side Pull
    - Growth of Hedge Funds
  - Development and growth of new sophisticated financial products
    - Credit derivatives
    - Energy markets
  - Computational Power

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RISK MANAGEMENT CAREER POTENTIAL

- Considerable growth in past 15 years
- Financial risk management expertise is one of hottest skill sets to have in the financial services industry
  - Excellent visibility
  - Outstanding salary potential

TYPICAL RISK MANAGEMENT FUNCTIONS

Market Risk

FUNCTIONS	JOB TITLES	EMPLOYERS
• Optimize financial risks for a trading portfolio • Analyze trading models implemented by traders • Assess trades and the risks each trade assumes	Market Risk Modeler Market Risk Specialist – Energy Market Risk Model Validation Market Risk Manager Market Risk Structurer – Exotics	Deutsche Bank Goldman Sachs Morgan Stanley Dynergy Ernst & Young Algorithmics

TYPICAL RISK MANAGEMENT FUNCTIONS

Credit Risk

FUNCTIONS	JOB TITLES	EMPLOYERS
• Develop and analyze default models	Credit Risk Modeler	Moody's KMV
	Credit Risk Specialist	Wachovia
• Evaluate likelihood a counterparty defaults	Credit Risk Model Validation	Federal Home Loan Banks
	Credit Risk Model Developer	Merrill Lynch
• Evaluate tradable credit risks		S&P
• Manage credit portfolio risks	Credit Portfolio Manager	

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TYPICAL RISK MANAGEMENT FUNCTIONS

Operational Risk

FUNCTIONS	JOB TITLES	EMPLOYERS
• Develop risk management systems and procedures to establish risk procedures on an individual and aggregate level • Allocate economic capital	Operational Risk Modeler Economic Capital Modeler Risk Management Model Validation Operational Risk Analyst	Citigroup Morgan Stanley BNP Paribas MFS Investment Management

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COMPENSATION TRENDS – RISK MANAGEMENT

	% of Total	Total Comp 2005	Total Comp 2006	Salary 2005	Salary 2006	Bonus-Cash 2005	Bonus-Cash 2006	Bonus- Non-Cash 2005	Bonus- Non-Cash 2006
Analyst/Associate	7%	$ 111,000	$ 121,000	$ 90,000	$ 92,000	$ 14,000	$ 20,000	$ 7,000	$ 9,000
Sr Assoc/Manager	10%	$ 150,000	$ 166,000	$ 100,000	$ 108,000	$ 25,000	$ 30,000	$ 25,000	$ 28,000
Vice President	35%	$ 242,000	$ 264,000	$ 142,000	$ 146,000	$ 64,000	$ 78,000	$ 36,000	$ 40,000
Director	13%	$ 295,000	$ 334,000	$ 170,000	$ 180,000	$ 80,000	$ 100,000	$ 45,000	$ 54,000
Senior VP	21%	$ 420,000	$ 462,000	$ 200,000	$ 208,000	$ 140,000	$ 160,000	$ 80,000	$ 94,000
Managing Director	9%	$ 900,000	$ 984,000	$ 250,000	$ 260,000	$ 376,000	$ 446,000	$ 274,000	$ 278,000
Chief Risk Officer	6%	$ 928,000	$1,022,000	$ 304,000	$ 310,000	$ 280,000	$ 312,000	$ 344,000	$ 400,000

Source: Risk Talent Associates Salary Survey 2007. All figures in US Dollars and rounded to nearest thousand.

	% of Total	Total Comp 2005	Total Comp 2006	Salary 2005	Salary 2006	Bonus-Cash 2005	Bonus-Cash 2006	Bonus- Non-Cash 2005	Bonus- Non-Cash 2006
Market Risk									
0-6 years	20%	$ 180,000	$ 203,000	$ 110,000	$ 120,000	$ 54,000	$ 65,000	$ 16,000	$ 18,000
7-15 years	57%	$ 435,000	$ 465,000	$ 170,000	$ 175,000	$ 140,000	$ 155,000	$ 125,000	$ 135,000
16+ years	23%	$ 550,000	$ 650,000	$ 200,000	$ 210,000	$ 185,000	$ 235,000	$ 165,000	$ 205,000
Credit Risk									
0-6 years	21%	$ 156,000	$ 190,000	$ 100,000	$ 114,000	$ 40,000	$ 56,000	$ 16,000	$ 20,000
7-15 years	42%	$ 364,000	$ 430,000	$ 180,000	$ 185,000	$ 124,000	$ 140,000	$ 60,000	$ 105,000
16+ years	37%	$ 425,000	$ 450,000	$ 180,000	$ 185,000	$ 145,000	$ 160,000	$ 100,000	$ 105,000

Source: Risk Talent Associates Salary Survey 2007. All figures in US Dollars and rounded to nearest thousand.

IMPORTANT SKILLS FOR RISK MANAGERS

- Knowledge and experience with range of financial products
  - "Risk management should not be separated from the activity of risk taking: you need to structure your positions according to the risks you understand. Risks you do not understand, should be avoided, period. Risk managers have difficult jobs." (Nassim Nicholas Taleb)
- Quantitative ability
  - "Risk managers must integrate precise quantitative analysis of-up-to-the-second data with quantitative wisdom derived from long-term history."
- Intellectual curiosity
- Independence
  - "Risk management is about rocking the boat, asking questions, and challenging the establishment. No one can manage risk if they are not prepared to take and question risk."
- Communication skills
- Problem solving ability

- Education
  - Finance and general management
  - Economics, engineering, physics, mathematics, statistics
  - BS, MS, MBA or PhD
- Suggested coursework
  - Portfolio management, derivatives, banking, fixed income securities, econometrics
  - Quantitative methods
    - Probability theory, numerical methods, stochastic analysis, modeling

GARP OFFERINGS FOR STUDENTS AND PROFESSORS

- FRM® (Financial Risk Manager) Certification
- GARP Digital Library
- GARP Research Center
- GARP Career Center
- GARP Risk Academy/Professional Training
- Student Membership

FRM® OVERVIEW

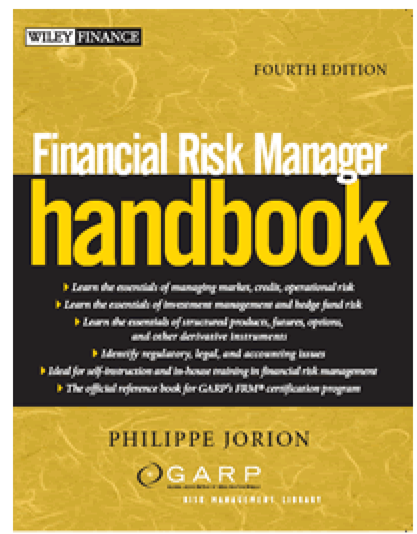
FRM Facts

- There are 13,676 FRMs in over 90 different countries
- The exam is given every November in over 70 testing sites across the world
- 5-hour exam
  - Two 2½ hour sessions
- 140 multiple choice questions

- The FRM is the certification for financial risk professionals worldwide
- The FRM Committee works to ensure that the certification comprehensively measures a financial risk manager's ability to manage risk in a real-world environment
  - ***Committee Chair:*** Prof. René Stulz, Ohio State University
- Practice-oriented examination
  - Questions derived from a combination of theory and real-world work experience
  - Test candidates understanding of risk management concepts and approaches and their application to a risk manager's day-to-day activities

FRM Requirements

- Pass FRM Exam
- Two years relevant risk management experience
- Continuing professional development



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Financial Risk Manager (FRM®)

Market Risk	•Weight: 30%
Credit Risk	•Weight: 25%
Operational and Integrated Risk Management, Legal	•Weight: 25%
Quantitative Analysis	•Weight: 10%
Risk Mgmt. for Investment Management	•Weight: 10%

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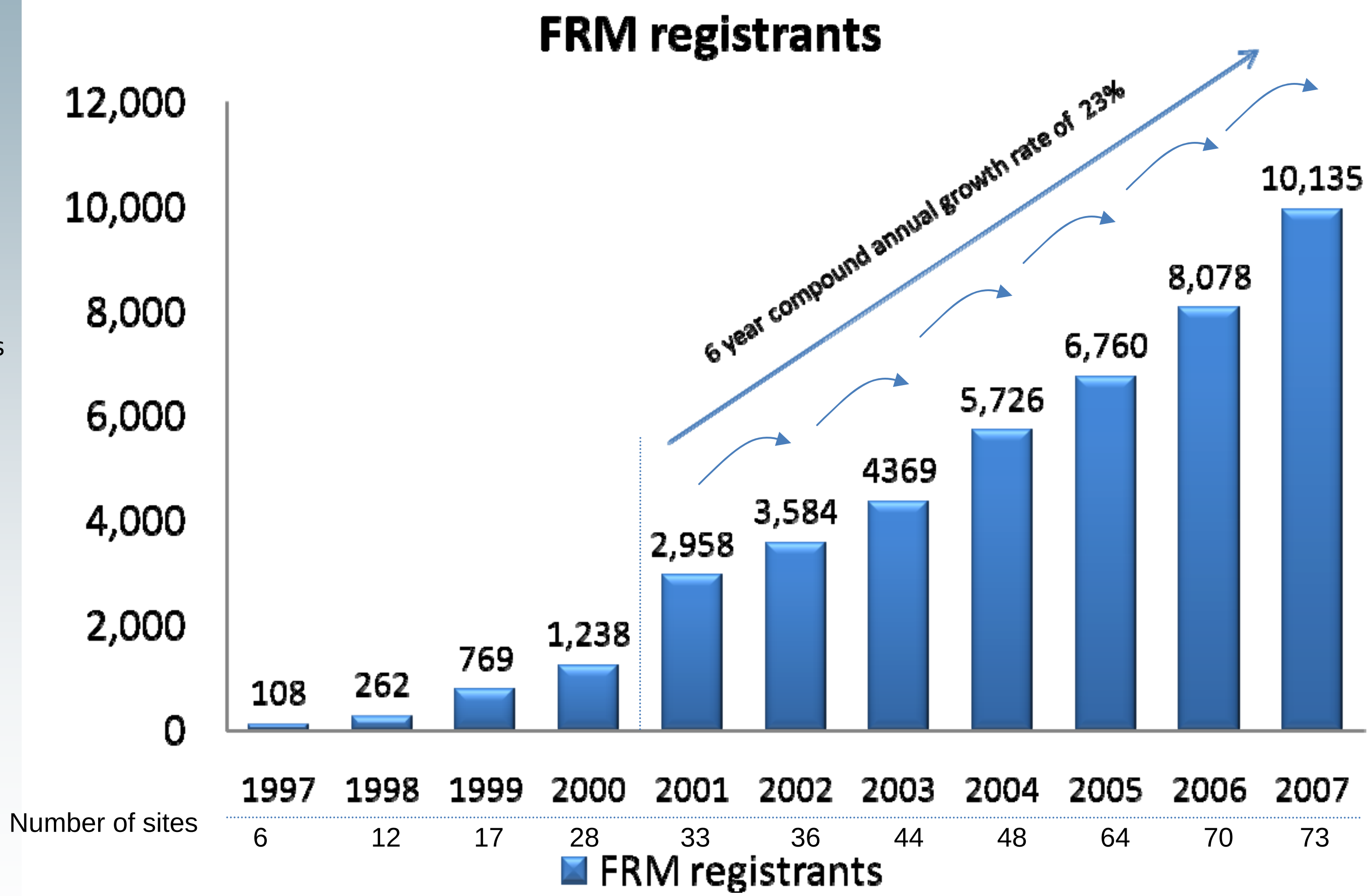
OVERALL FRM® GROWTH

Objective evidence of FRM® as the benchmark for risk professionals worldwide

FRM Facts

- In 2007, the #1 source for FRM candidates was word-of mouth – either a colleague or a current FRM holder

Top 10 firms with FRMs
- UBS
- Citigroup
- HSBC
- Price Waterhouse Coopers
- Bank of China
- Samsung
- BBVA
- ING
- Industrial & Commercial Bank of China
- Deloitte & Touche



ORGANIZATIONS REPRESENTED BY FIVE OR MORE 2007 FRM® CANDIDATES

3i Infotech* • ABN AMRO Bank • ABS Group* • Absa Bank Ltd • Abu Dhabi Investment Authority• Accenture • Adventity* • Aegon* • Agricultural Bank of China • Agricultural Development Bank* • AIG Global Investment Group • Ajo University • Algorithmics* • Allianz Life • Allied Irish Bank* • Amba Research* • American Express Bank Ltd • American Intl. Assurance Co. Ltd. • Aptivaa Consulting* • Asian Development Bank* • Asian Institute of Management* • Asian Institute of Management* • AXA* • Banco Bilbao Vizcaya United Bank • Banco Sabadell* • Bangko Sentral Ng Phillippines • Bank Alfalah Limited • Bank of America • Bank of Beijing• Bank of China • Bank of Communication • Bank of East Asia Limited • Bank of Korea • Bank of Montreal • Bank of Nova Scotia • Bank of Overseas Chinese* • Bank of Taiwan • Bank of Tokyo-Mitsubishi, Ltd. • Bank SinoPac • Banking Regulation & Supervision Agency* • Barclays Capital • Bear Stearns & Co • BearingPoint • BHP Billington* • Bloomberg L.P. • BMO Financial Group • BNP Paribas • Caisse de dépôt et placement du Québec* • Caixa d'Estalvis I Pensions de Barcelona* • Calyon Bank • Canada Mortgage & Housing • Canara Bank • Canadadian Imperial Bank of Commerce* • Capgemini • Capital One* • Central Bank of Nigeria* • Central University of Finance & Economics • Chailease Finance Co., Ltd • Chang Hwa Commercial Bank • China Banking Regulatory Commission* • China Construction Bank • China Development Bank • China Everbright Bank• China Life Insurance Co. • China Merchants Bank • China Minsheng Banking Corp* • China Securities Co.* • Chinatrust Commercial Bank • Chinese University of Hong Kong* • Chong Hing Bank* • Chung-Ang University • Chung-Nam University* • CIBC • Citic Ka Wah Bank • Citigroup • City University of Hong Kong • City University of New York* • CLSA* • Coface* • Cognizant Technology Solutions • Columbia University* • Convoy* • Cosmos Bank* • Countrywide Financial* • Credit Agricole Asset Management • Crisil* • D.E. Shaw India Software* • Dexia-Building Life Insurance • Dong-Seo University • Dongsuk University* • Dresdner Kleinworf Wasserstein Bank • DTE Energy* • Dun & Bradstreet* • E Trade* • E. Sun Bank • East China National University • Edelweiss Capital* • Emirates Bank International • Ernst & Young • Evalueserve* • Ewha Womans University • Export-Import Bank of China • Fact Set* • Fannie Mae • Far Eastern Group* • FDIC* • Federal Home Loan Bank* • Federal Reserve Bank • Fidelity Investments • Fimat Hong Kong Limited • Financial Supervisory Service • First Bank • First Commercial Bank • Fortis Bank • Franklin Templeton Investments • Freddie Mac* • Fu Jen Catholic University • Fubon Bank • Fudan University • Fuhwa Bank • Futures First* • FXCM* • General Electric • Genpact Analytics • GlobeOp Financial Services • Goldman Sachs • Grad. 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represents new organizations in 2007 with five or more FRM® Candidates

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An American investor holds a portfolio of French stocks. The market value of the portfolio is €10 million, with a beta of 1.35 relative to the CAC index. In November, the spot value of the CAC index is 4,750. The exchange rate is USD 1.25/€. The dividend yield, euro interest rates, and dollar interest rates are all equal to 4%. Which of the following option strategies would be most appropriate to protect the portfolio against a decline of the euro that week?

March Euro options (all prices in US dollars per €)

Strike	Call euro	Put euro
1.25	0.018	0.022

a) Buy calls with a premium of USD 180,000
b) Buy puts with a premium of USD 220,000
c) Sell calls with a premium of USD 180,000
d) Sell puts with a premium of USD 220,000

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FRM® RESOURCES FOR STUDENTS

Ajou University • Baruch College • Beijing Institute of Technology • Beijing Wuzi University • Beijing University of Aeronautics & Astronautics • Boston College • Boston University • Brandeis University • Johns Hopkins University • China Agricultural University • Chinese Academy of Science • Chon-Buk National University • Chon-Nam National University • Chung-Ang University • City University of Hong Kong • Columbia University Concordia University • Cornell University • Drexel University • Duke University • George Washington University • Georgia State University • Goethe University of Frankfurt • Hankuk University of Foreign Studies • Han-Yang University • Harvard University • Hawaii Pacific University • Hofstra University • Hong Kong University • Illinois Institute of Technology • Indian Institute of Management • Korean Advanced Institute of Science and Technology • King's College • Korea University • Kung-Hee University • Kyung-Hee University • Lancaster University • London School of Economics • Loyola University • Manchester Business School • McGill University • Michigan State University • Ming Chuan University • Massachusetts Institute of Technology • Nanchang University • Nankai University • National Cheng-Chi University • National Kaohsiung First University of Science & Technology • National University of Singapore • National Taiwan University • New York University• Narsee Monjee Institute of Management Studies• North Carolina State University • Ohio State University• Pace University • Peking University• Providence University • Purdue University • Pusan National University • Rotman School of Management • Rutgers University • Sejung University • Seoul National University • Shanghai university of Finance & Economics • Sogang University• Soonsil University • Southwest University of Finance & Economics • St. Joseph's University • Stanford University • State University of New York • SungKyunKwang University • Swedish School of Economics • Temple University • Texas A&M University • Tonjii University • Tuck School of Business • University of Hong Kong• University of Arizona • University of Birmingham • University of California – Berkley • University of Cambridge• University of Chicago • University of Essex • University of Florida • University of Frankfurt • University of Illinois • University of Innsbruck • University of Korea • University of Melbourne • University of Michigan • University of Montreal • University of Munich • University of New Brunswick • University of North Carolina • University of Notre Dame• University of Oxford • University of Pennsylvania • University of Pittsburgh • University of Southampton• University of Southern California • University of Sydney • University of Seoul • University of Texas • University of Toronto • University of Victoria • University of Utrecht • University of Wisconsin • University of Cambridge • United Arab University • Utah State University • Warwick University • Washington University • Wharton Business School • Xiamen University • Yonsei University • York University • Zhejiang University

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- FRM® Study Guide
  - Outlines FRM® topics/subtopics and core readings
  - Material covered by most Master's level curriculum
  - Freely available from GARP website
    - http://www.garp.com/frmexam/studyguide.asp
- FRM® Scholarship Program
  - Registration fee waiver
  - Available for up to 2 students or faculty from each school annually
  - More information available at

    http://www.garp.com/frmexam/download/FRMStudentScholarship.pdf
- FRM® Practice Exams
  - Sign up to GARP Digital Library (www.garpdigitallibrary.org)
  - Send me an email saying that you are an DePaul University student and I will have the 2007 Practice exams added to your account

INTERESTED?

General words of advice

- Start with the end in mind
  - Learn what the job possibilities are now
    - GARP Career Center
    - quantfinance.com, efinancialcareers.com, wilmott.com
    - SSRN – Financial Economics Network
    - Location, market, skill set
- Know the interview process
  - "Heard on the Street", Crack
  - "My Life as a Quant", Derman
  - "Frequently asked questions in Quantitative Finance", Wilmott
- Know the markets
  - Know the lingo
  - Know the issues
  - Know the general trends

GARP DIGITAL LIBRARY

Largest digital library in the world dedicated to the financial risk management community

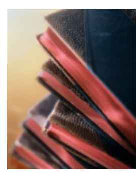
Publishers Participating

- Addison-Wesley
- Blackwell
- Bloomberg Press
- Euromoney Books
- Longtail Publishing
- McGraw-Hill
- Princeton University Press
- Risk Books
- Thomson South-Western
- Wiley & Sons, Inc.
- World Scientific Press

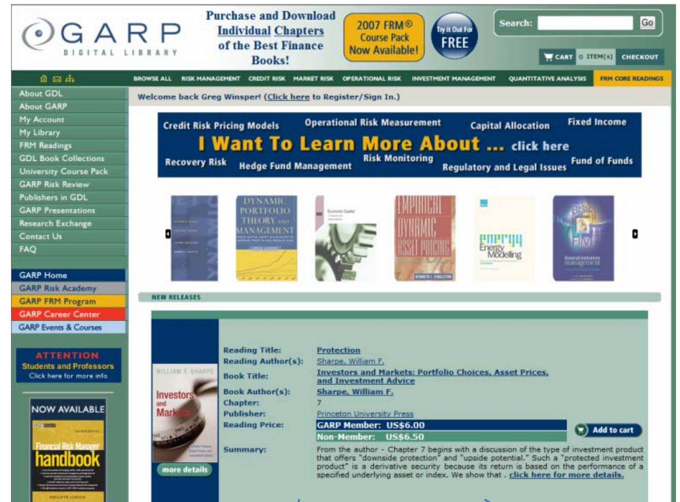
Publishers

Research

Journals



Editorial Committee



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- iReadings^{TM} allow user to download <u>individual</u> chapters of books, saving both time and money
- Hub for risk management education and research material

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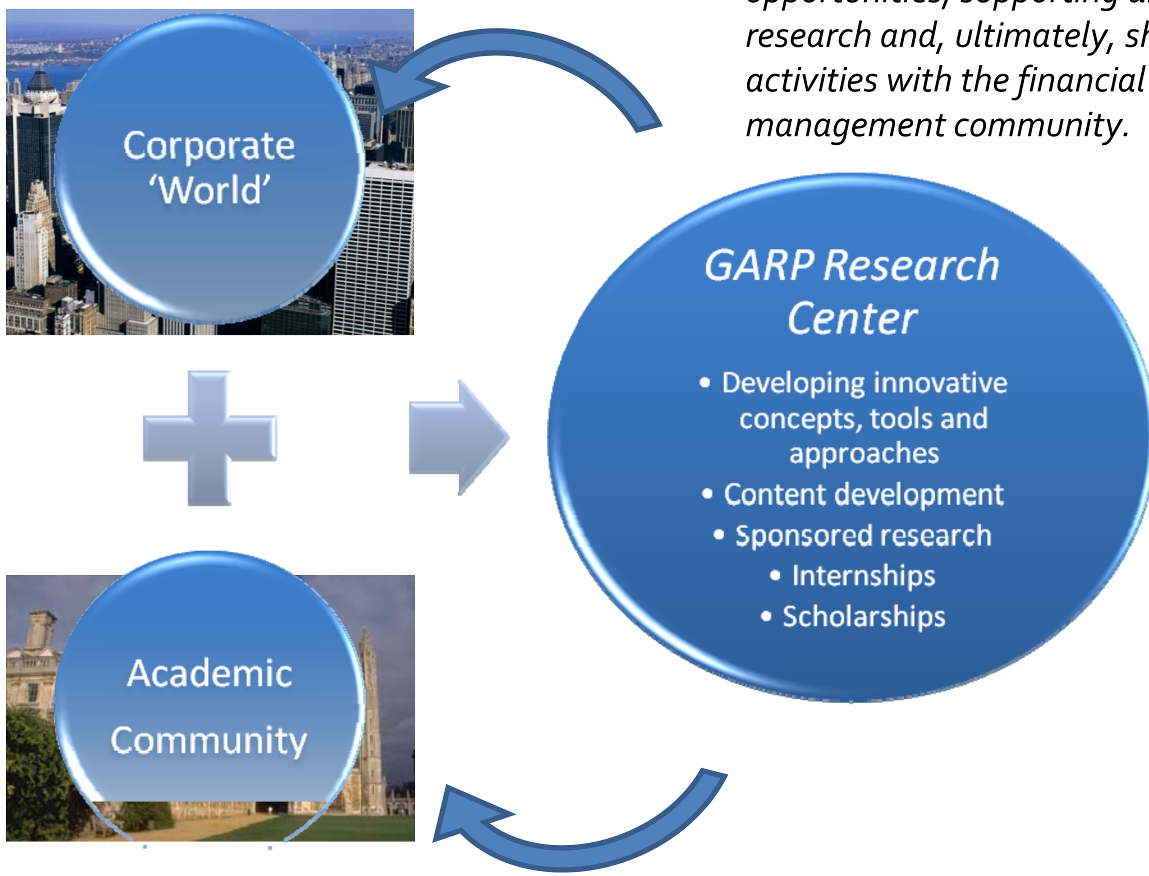
GARP RESEARCH CENTER

Advancing the profession by creating a unique bridge between the academic and practitioner communities

The GARP Research Center serves as the driving force for practitioner-oriented research by illuminating future trends and opportunities, supporting and conducting research and, ultimately, sharing these activities with the financial risk management community.



GARP
GLOBAL ASSOCIATION OF RISK PROFESSIONALS

GARP RESEARCH CENTER

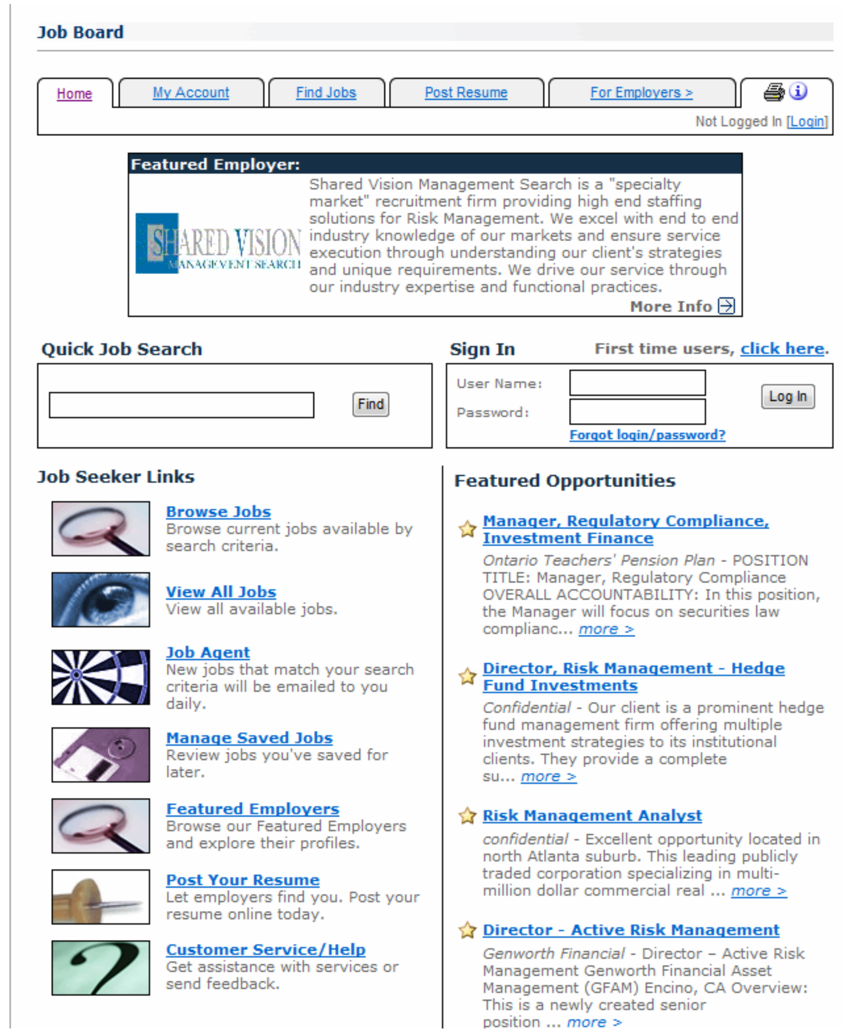
- GARP Risk Management Research Program
  - Sponsored research
  - Awarded funding to 6 research projects in 2007
    - "Does Short-term Debt Cause Financial Distress and Crises?"
      - Efraim Benmelech, Harvard
    - "Developing an Early Warning System for Currency Crises: A Multivariate Extreme Value Approach"
      - Phornchanok Cumperayot, Chulalongkorn University, Thailand
      - Roy Kouwenberg, Mahidol University, Thailand
    - "Commodity Price Risk Management and Institutional Ownership Clienteles"
      - Phil Davies and Bernadette A. Minton, Ohio State University
      - Catherine Schrand, University of Pennsylvania
    - "Estimating the Feedback of Defaults"
      - Kay Giesecke, Stanford
    - "Firm Performance and the Implementation of Enterprise Risk Management Processes"
      - Don Pagach and Richard Warr, North Carolina State University
    - "Design, Takeup and Impact of Rainfall Insurance: Evidence from India",
      - Robert Townsend, University of Chicago
      - Xavier Giné, World Bank
      - James Vickery, Federal Reserve Bank of New York
  - 2008 Call for Research Proposals – submissions due March 31, 2008
- Internship program (starting in 2008)
  - Build research connection between GARP's strong practitioner connections and academic researchers

GARP CAREER CENTER

Ideal meeting place for job seekers and employers in financial risk management

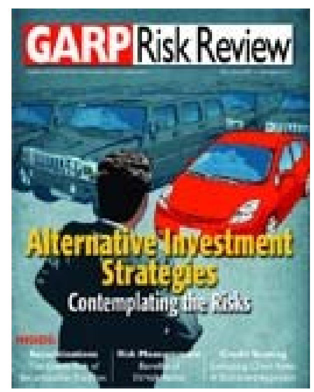
http://www.garp.com/careercenter/

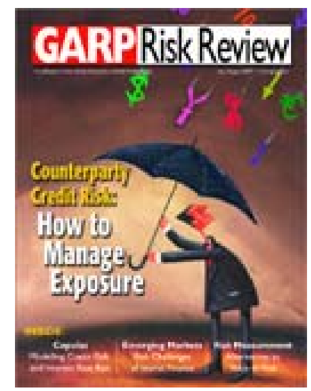
- Over 1,000 job seekers registered
- Over 150 new jobs posted monthly
- Over 50 employers posting jobs



STUDENT MEMBERSHIP

- GARP Membership
  - Student membership - $50 per year
  - Affiliate membership – Free
- Paid membership includes:
  - Discounts on events, courses, GDL readings
  - GARP Risk Review subscription





- New York Chapter meetings

Creating a culture of risk awareness.™

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