Knowledge, Skills and Abilities of a Financial Risk Manager

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GARP

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Outline

• What is a Job Task Analysis?
• Process Summary
• Participant Demographics
• Results Summary
• Key observations
• FRM/ERP Recognition
Job Task Analysis

• “To identify the knowledge and skills necessary for competent practice, it is important to complete an analysis of the actual work performed and then document the tasks and responsibilities that are essential to the occupation or profession of interest.”

• Purpose for GARP:
  • What do financial risk managers do?
    • Frequency/Importance
  • What knowledge and skills are required to support the competent performance of these tasks?

• Use for GARP:
  • Validate certification examinations → FRM
  • Basis for defending the appropriateness of the examination content
Process Summary

- Study done with Pearson VUE and International Credential Associates (PI)
- Methodology
  - July 2014 – Development of risk management profession survey
  - September 2014 – FRMs and other risk professionals surveyed
  - January 2015 – Final report of survey results
  - Future – Guide revisions to the FRM curriculum
Survey Information

• Task and Knowledge/Skill Areas separated into 10 Domains

<table>
<thead>
<tr>
<th>Domain</th>
<th>No. of Tasks</th>
<th>No. of Knowledge/Skill Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Governance</td>
<td>22</td>
<td>19</td>
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<tr>
<td>Quantitative Analysis</td>
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<td>Modeling</td>
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<td>Credit Risk</td>
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<tr>
<td>Operational Risk</td>
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<td>14</td>
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<tr>
<td>Enterprise Risk Management</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Portfolio Management</td>
<td>20</td>
<td>19</td>
</tr>
</tbody>
</table>

• For each task and knowledge area, respondents were asked to rate its importance
  • 0 – Of no importance
  • 1 – Of little importance
  • 2 – Moderately important
  • 3 – Important
  • 4 – Very important

• An importance rating of 2.5 or higher is used to automatically include a task or knowledge/skill in the delineation of the financial risk management role
Participant Demographics

- Over 1,400 participants
  - 85% of participants are FRMs
Participant Demographics (cont.)

Participants by Country

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>USA</td>
<td>20%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>10%</td>
</tr>
<tr>
<td>Canada</td>
<td>5%</td>
</tr>
<tr>
<td>India</td>
<td>5%</td>
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<tr>
<td>China</td>
<td>5%</td>
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<tr>
<td>Switzerland</td>
<td>1%</td>
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<tr>
<td>United Kingdom</td>
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<tr>
<td>Singapore</td>
<td>1%</td>
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<tr>
<td>Germany</td>
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<tr>
<td>Netherlands</td>
<td>1%</td>
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Participants by Highest Level of Education

<table>
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<tr>
<th>Education Level</th>
<th>Percentage</th>
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<tr>
<td>Master's Degree</td>
<td>70%</td>
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<tr>
<td>Bachelor's Degree</td>
<td>30%</td>
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<tr>
<td>PhD</td>
<td>10%</td>
</tr>
<tr>
<td>Other</td>
<td>10%</td>
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</table>
Results Highlights – Tasks

• Top Ten in Importance (highest % of “Very Important” ratings)
  • Risk Governance – Communicate risk to stakeholders
  • Modeling – Estimate, interpret, and report VaR
  • Financial Markets – Assess counterparty risk
  • Risk Governance – Ensure compliance with regulatory updates
  • Credit Risk – Calculate PD, EAD, and LGD
  • Financial Markets – Identify and measure risks in individual assets and asset classes
  • Modeling – Communicate and report deficiencies of VaR
  • Financial Markets – Identify and measure risks in derivatives
  • Modeling – Select appropriate VaR model
  • Credit Risk – Calculate regulatory capital for credit risk
Top Ten in Importance by Domain (highest % of “Very Important” ratings)

- (1) Risk Governance – Communicate risk to stakeholders
- (2) Modeling – Estimate, interpret, and report VaR
- (3) Financial Markets – Assess counterparty risk
- (5) Credit Risk – Calculate PD, EAD, and LGD

- …

- (13) Portfolio Management – Calculate and evaluate portfolio risk measures
- (14) Market Risk – Design stress scenarios to capture relevant risks/exposures
- (15) Model Risk Governance – Prepare documentation that complies with regulatory and internal requirements
- (16) Enterprise Risk Management – Calculate regulatory capital ratio
- (24) Operational Risk – Identify control weaknesses that may lead to rogue trading
- (31) Quantitative Analysis – Communicate limitations and assumptions of modeling
Results Highlights – Tasks

• Bottom Ten in Importance (lowest % of “Very Important” ratings)
  • Modeling – Interpret an actuarial table and analyze impact of changes in risk factors
  • Quantitative Analysis – Test statistical independence
  • Risk Governance – Link accounting asset classification to capital position
  • Quantitative Analysis – Conduct maximum likelihood estimations
  • Quantitative Analysis – Aggregate distributions to extract joint probability distributions
  • Risk Governance – Monitor economic calendar with relation to current risk position
  • Quantitative Analysis – Compare data backfilling methods
  • Quantitative Analysis – Identify violations of best linear unbiased estimator assumptions
  • Quantitative Analysis – Estimate generalized linear models with maximum-likelihood estimation and/or Bayesian methods
  • Quantitative Analysis – Perform Bayesian analysis
Results Highlights – Tasks by Domain

• Bottom Ten in Importance (lowest % of “Very Important” ratings)
  • (1) Quantitative Analysis – Perform Bayesian analysis
  • (5) Risk Governance – Monitor economic calendar with relation to current risk position
  • (10) Modeling – Interpret actuarial table and analyze impact of changes in risk factors
  • ...
  • (12) Financial Markets – Utilize put call parity to identify arbitrage opportunities
  • (14) Market Risk – Evaluate strategies using exotic options
  • (15) Operational Risk – Extract correlation structures for operational risk
  • (18) Portfolio Management – Calculate adjustment factor for autocorrelated returns
  • (25) Credit Risk – Select credit risk benchmarks (e.g., iTraxx, CDX, ABX)
  • (47) Model Risk Governance – Create a model inventory
  • (52) Enterprise Risk Management – Establish and validate risk adjusted hurdle rate
Results Highlights – Knowledge/Skill

- Top Ten in Importance (highest % of “Very Important” ratings)
  - Risk Governance – Basic risk types
  - Modeling – Value-at-risk (VaR)
  - Enterprise Risk Management – Liquidity risk
  - Market Risk – Stress scenarios
  - Financial Markets – Interest rates and measures of interest rate sensitivity
  - Risk Governance – Role of risk management in corporate governance
  - Financial Markets – Bonds, loans, equities, commodities, and FX
  - Financial Markets – Risk management strategies
  - Financial Markets – Forwards, futures, swaps and options
  - Modeling – Stress testing and scenario analysis
Results Highlights – Knowledge/Skill

• Top in Importance by Domain (highest % of “Very Important” ratings)
  • (1) Risk Governance – Basic risk types
  • (2) Modeling – Value-at-risk (VaR)
  • (3) Enterprise Risk Management – Liquidity risk
  • (4) Market Risk – Stress scenarios
  • (5) Financial Markets – Interest rates and measures of rate sensitivity

• …

• (11) Model Risk Governance – Limitations and weaknesses of models
• (24) Credit Risk – Counterparty risk
• (36) Portfolio Management – Concentration risk and exposure measures
• (58) Quantitative Analysis – Simulation methods
• (59) Operational Risk – OR event types and factors
Task Importance by Domain

Average Importance Ranking of Tasks by Domain

- E. Model Risk Governance
- C. Financial Markets
- I. Enterprise Risk Management
- D. Modeling
- F. Market Risk
- J. Portfolio Management
- A. Risk Governance
- G. Credit Risk
- H. Operational Risk
- B. Quantitative Analysis
Knowledge/Skill Importance by Domain

Average Importance Ranking of Knowledge/Skill by Domain

- E. Model Risk Governance
- I. Enterprise Risk Management
- C. Financial Markets
- A. Risk Governance
- D. Modeling
- H. Operational Risk
- F. Market Risk
- G. Credit Risk
- J. Portfolio Management
- B. Quantitative Analysis
Task Importance by Domain and Function

Average Importance Ranking by Domain

Group 1: I am not presently involved with financial risk management
Group 2: I perform financial risk management tasks
Group 3: I regularly work with financial risk management professionals
Group 4: I supervise people who perform financial risk management tasks
Group 5: I teach or train financial risk management professionals

Task Emphasis by Domain and Function

Difference from Composite of Average Importance Ranking by Domain

- **Group 1**: I am not presently involved with financial risk management
- **Group 2**: I perform financial risk management tasks
- **Group 3**: I regularly work with financial risk management professionals
- **Group 4**: I supervise people who perform financial risk management tasks
- **Group 5**: I teach or train financial risk management professionals
K/S Emphasis by Domain and Function

Difference from Composite of Average Importance Ranking of Knowledge/Skill by Domain

- Group 1: I am not presently involved with financial risk management
- Group 2: I perform financial risk management tasks
- Group 3: I regularly work with financial risk management professionals
- Group 4: I supervise people who perform financial risk management tasks
- Group 5: I teach or train financial risk management professionals

Future of Risk Management

• What changes do you expect in the financial risk management profession within the next 2-3 years?
  • More regulation
    • Complexity vs. simplicity
  • More compliance
  • Less VaR, more stress testing
  • Quantitative vs. qualitative
  • Greater focus and sophistication on liquidity risk
  • Greater emphasis on data quality and information security
Conclusion

- This Job Task Analysis will be a valuable input to keeping the FRM curriculum aligned with risk management practice.

- Survey observations
  - Communication skill is very important.
  - VaR remains relevant, with caveats that we understand and communicate shortcomings.
  - Risk managers must understand financial products, markets and the role of risk management.
  - Risk managers must know how to measure counterparty risk, credit risk (PD, EAD, LGD), market risk of derivatives and liquidity risk.
  - Sophisticated quantitative skills may be needed by some but not required generally.

- Considerations for the future
  - Compliance.
  - More stress testing.
  - More liquidity risk.
  - Data quality.
  - Cybersecurity.
FRM and ERP Recognition
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<td>Kit Sun Ng</td>
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# New ERPs

**Newly Certified**

- David Janisse
- Oleg Nikiporets

**Passed November ERP Exam**

- Salik Shakil Ansari
- Wen Dong
- Elliot Keeping
FRM and ERP Study Group Formation
Creating a culture of risk awareness*

**Global Association of Risk Professionals**

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Results Summary – Quantitative Analysis

• **Tasks**
  - **High importance**
    - Perform simulations
    - Communicate limitations and assumptions of modeling
    - Conduct time-series analysis
  - **Low importance**
    - Test statistical independence
    - Compare data backfilling methods
    - Aggregate distributions to extract their joint probability distributions
    - Estimate generalized linear models with maximum-likelihood estimation (MLE) and/or Bayesian methods
    - Perform Bayesian analysis

• **Knowledge/Skills**
  - **High importance**
    - Simulation methods
    - Limitations and assumptions of modeling including relationship to decision making
    - Time-series analysis
  - **Low importance**
    - Bayesian methods
    - Copulas
Results Summary – Financial Markets

• **Tasks**
  - High importance
    - Perform simulations
    - Communicate limitations and assumptions of modeling
    - Conduct time-series analysis
  - Low importance
    - Test statistical independence
    - Compare data backfilling methods
    - Aggregate distributions to extract their joint probability distributions
    - Estimate generalized linear models with maximum-likelihood estimation (MLE) and/or Bayesian methods
    - Perform Bayesian analysis

• **Knowledge/Skills**
  - High importance
    - Simulation methods
    - Limitations and assumptions of modeling including relationship to decision making
    - Time-series analysis
  - Low importance
    - Bayesian methods
    - Copulas
Results Summary – Modeling

**Tasks**

- High importance
  - Perform simulations
  - Communicate limitations and assumptions of modeling
  - Conduct time-series analysis
- Low importance
  - Test statistical independence
  - Compare data backfilling methods
  - Aggregate distributions to extract their joint probability distributions
  - Estimate generalized linear models with maximum-likelihood estimation (MLE) and/or Bayesian methods
  - Perform Bayesian analysis

**Knowledge/Skills**

- High importance
  - Simulation methods
  - Limitations and assumptions of modeling including relationship to decision making
  - Time-series analysis
- Low importance
  - Bayesian methods
  - Copulas
Results Summary – Model Risk Governance

• **Tasks**
  • High importance
    • Perform simulations
    • Communicate limitations and assumptions of modeling
    • Conduct time-series analysis
  • Low importance
    • Test statistical independence
    • Compare data backfilling methods
    • Aggregate distributions to extract their joint probability distributions
    • Estimate generalized linear models with maximum-likelihood estimation (MLE) and/or Bayesian methods
    • Perform Bayesian analysis

• **Knowledge/Skills**
  • High importance
    • Simulation methods
    • Limitations and assumptions of modeling including relationship to decision making
    • Time-series analysis
  • Low importance
    • Bayesian methods
    • Copulas
Results Summary – Market Risk

• **Tasks**
  - High importance
    - Perform simulations
    - Communicate limitations and assumptions of modeling
    - Conduct time-series analysis
  - Low importance
    - Test statistical independence
    - Compare data backfilling methods
    - Aggregate distributions to extract their joint probability distributions
    - Estimate generalized linear models with maximum-likelihood estimation (MLE) and/or Bayesian methods
    - Perform Bayesian analysis

• **Knowledge/Skills**
  - High importance
    - Simulation methods
    - Limitations and assumptions of modeling including relationship to decision making
    - Time-series analysis
  - Low importance
    - Bayesian methods
    - Copulas
Results Summary – Credit Risk

• **Tasks**
  - **High importance**
    - Perform simulations
    - Communicate limitations and assumptions of modeling
    - Conduct time-series analysis
  - **Low importance**
    - Test statistical independence
    - Compare data backfilling methods
    - Aggregate distributions to extract their joint probability distributions
    - Estimate generalized linear models with maximum-likelihood estimation (MLE) and/or Bayesian methods
    - Perform Bayesian analysis

• **Knowledge/Skills**
  - **High importance**
    - Simulation methods
    - Limitations and assumptions of modeling including relationship to decision making
    - Time-series analysis
  - **Low importance**
    - Bayesian methods
    - Copulas
Results Summary – Operational Risk

• **Tasks**
  - High importance
    - Perform simulations
    - Communicate limitations and assumptions of modeling
    - Conduct time-series analysis
  - Low importance
    - Test statistical independence
    - Compare data backfilling methods
    - Aggregate distributions to extract their joint probability distributions
    - Estimate generalized linear models with maximum-likelihood estimation (MLE) and/or Bayesian methods
    - Perform Bayesian analysis

• **Knowledge/Skills**
  - High importance
    - Simulation methods
    - Limitations and assumptions of modeling including relationship to decision making
    - Time-series analysis
  - Low importance
    - Bayesian methods
    - Copulas
Results Summary – Enterprise Risk

• **Tasks**
  - **High importance**
    - Aggregate market, credit, and operational risk and report enterprise risk
    - Articulate the difference between regulatory, stress, and economic capital
    - Calculate regulatory capital ratio
  - **Low importance**
    - Conduct reverse stress testing
    - Establish and validate risk adjusted hurdle rate

• **Knowledge/Skills**
  - **High importance**
    - Liquidity risk
    - Regulatory capital
    - Economic capital
  - **Low importance**
    - Reverse stress testing
Results Summary – Portfolio Management

• Tasks
  • High importance
    • Calculate, compare, and evaluate portfolio risk measures
    • Calculate portfolio standard deviation and correlation
  • Low importance
    • Calculate adjustment factor for autocorrelated returns

• Knowledge/Skills
  • High importance
    • Concentration risk and exposure measures
    • Risk monitoring and performance measurement (e.g., limits)
    • Risk-adjusted performance measurement
  • Low importance
    • Style drift detection
    • Active share