

Investment Office Roadmap

Organization Systems & Controls

Target Operating Model Status

Janine Guillot, COIO

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Roadmap Objectives

- The INVO Roadmap consists of six strategic priorities
 - Organization Systems and Controls 
- Organization Systems and Controls Objective: Design, develop and implement a robust target operating model that minimizes complexity, improves transparency, and strengthens processes, systems, governance and controls

Organization, Systems & Controls Today (FROM)	(TO) Vision
Risk exposure due to inefficient legacy, asset-based "cottage industry" approach geared toward specialized, siloed investment strategies	Efficient operational processes and technology with verifiable, transparent controls necessary to manage INVO wide global investment strategies
Fragmented and incomplete data & infrastructure; impossible to aggregate information for timely investment management and decision making	Integrated data and systems for efficient, timely decision making driving superior investment performance
Unnecessary complexity for the value derived	Appropriate blend of simplicity and complexity
Obscured accountability and unclear roles	Transparent organization structure, roles and processes for clear accountability

Target Operating Model History

- Original staff work was completed in December 2010 and presented to the Investment Committee in February 2011
- INVO Risk Assessment (Heat Map)
 - Collaborative effort across the Investment Office that identified and force ranked 24 top risks
 - Top three risks from 2010 Risk Heat Map:
 1. Data Integrity
 2. Portfolio Data and Analytics
 3. Control Environment
- Target Operating Model
 - Defined standard investment functions
 - Assessed INVO capabilities (people, process, technology) compared to industry standards
 - Developed Roadmap of prioritized initiatives to close gaps

Today's presentation is an update on progress during 2011/12 and INVO's plans to refresh the Risk Heat Map and the Target Operating Model.

2010 INVO Risk Assessment

Risk Identification Results

24 Key Identified Risks Assessed at Workshop – Ranking and Functional Organization

ISG	INVO Exec	Op Comm	Op Comm	Board/Leadership
Investment	Human Capital	Information Management	Operational	Strategic / External
External Manager / Partner Selection, Monitoring & Rights	Skills & Capabilities	Data Integrity	Control Environment	Governance / Stakeholder Support & Influence
Market / Systemic	Leadership / Direction	Portfolio Data & Analytics	IT Infrastructure Adequacy	Market / Systemic
Investment Decision Process	Recruiting & Retention	Institutional Knowledge	Contract Management	External Influence
Asset Allocation Strategy / Portfolio Structure	Incentive Alignment / Structure		Ethics / Fraud	Business Model
Liquidity				Defined Benefit Viability
Interest Rates		Target Operating Model Focus		
Counterparty				
Currency / Foreign Exchange				

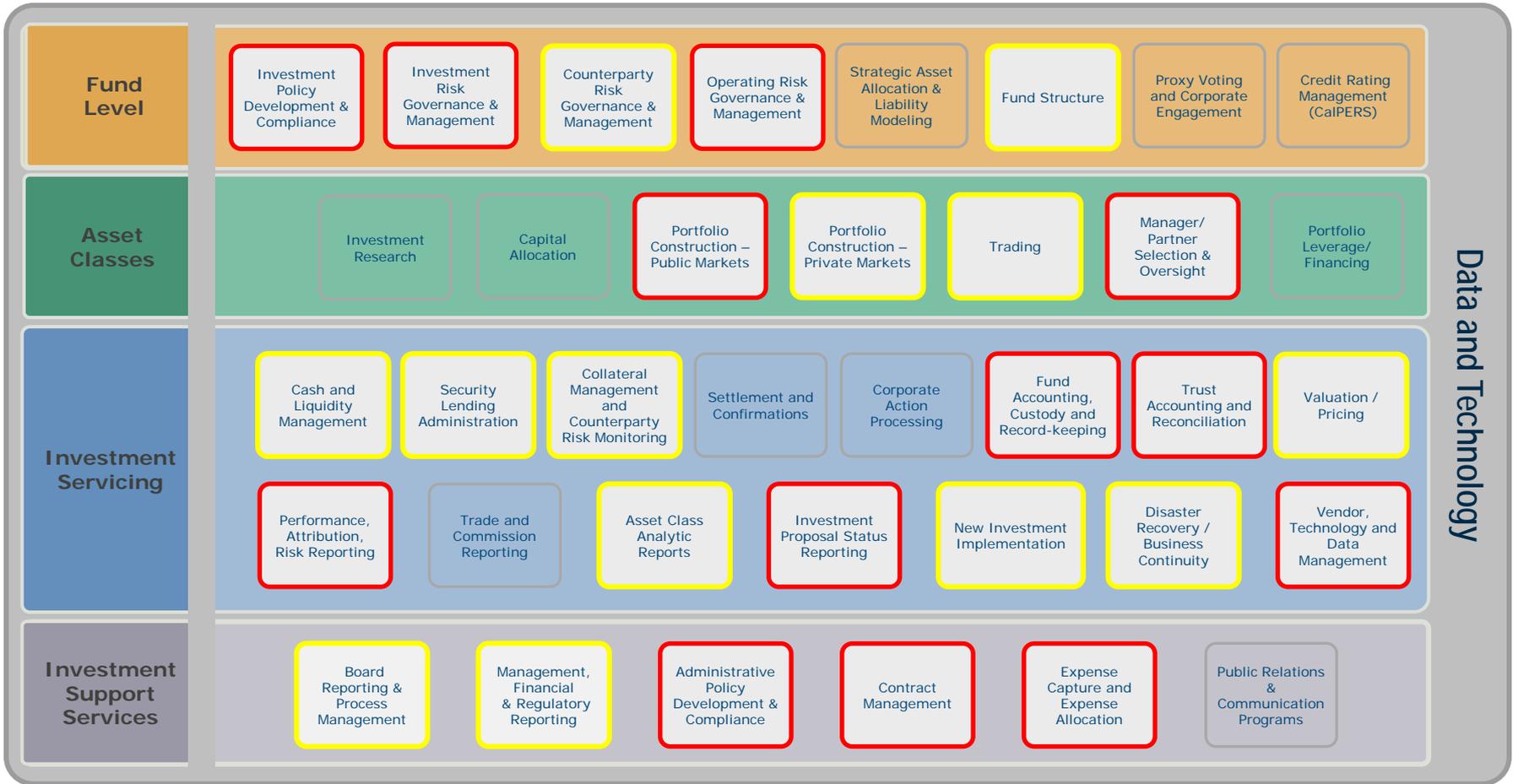
Use Risk Heat Map to:

- Prioritize opportunities and TOM initiatives
- Identify dependencies and obstacles
- Guide implementation of robust organization systems and controls

Target Operating Model - Key Focus Areas

Key

- Red – High Priority, Major initiatives in 2011/2012
- Yellow – Medium Priority area, incremental work 2011/2012
- Others – Business as Usual or Low Priority



Major TOM Initiatives: Sequence and Status

Initiative	Initiative Status	2011			2012			2013		
PM2: "Public Markets Portfolio Management"	G									
Custody & Fund Accounting	C									
Investment Risk Management System	C									
Private Equity Portfolio Management System and Accounting and Data Services	G									
INVO Expense Management	A									
Derivatives Central Clearing	G									
Contract Management	A									
Investment Compliance Monitoring	G									
Administrative Policies and Procedures	A									
Manager Selection & Monitoring	G									
Operating Risk Governance & Management	G									
Fund Structure	A									
Performance Measurement & Attribution	R									
Pricing / Valuation	N/A									
Cash Management	N/A									
Technology and Vendor Management	G									
Trust Accounting & Reconciliation / GL Close	A									
Records Retention, Document Management & PRA	N/A									
Data Services (Governance)	N/A									
CRM - Salesforce Expansion	N/A									

* incremental and / or targeted work underway
 N/A: Major Initiatives not started

G On Target
 A Needs Attention
 R Major issues will impact Initiative timeline
 C Completed Initiative

Major Accomplishments for 2011/12

PM2: “Public Markets Portfolio Management”: New Investment Book of Record (IBOR), upgraded order management system, comprehensive overhaul of portfolio construction process for internal Global Equity program

- Fully reconciled, trade-date based position, cash and foreign currency balances
- Upgraded and externally hosted Charles River Development order management system
- Retirement of manual, Excel-based portfolio construction process – significantly reducing operational risks
- Phase 2, IBOR implementation with State Street, expected to be completed November 2012; Charles River position projection expected in April 2013

Custody & Fund Accounting: End-to end transformation of custody and fund accounting services

- Implemented a comprehensive governance model with contractual Service Level Agreements and Performance Indicators
- Migrated to daily, “hard close” accounting structure resulting in greater precision of performance and portfolio data / value
- Incorporated the majority of State Street provided services under a single contract structure

Investment Risk Management System: Implemented BarraOne Total Fund investment risk system

- Provides investment risk reporting and monitoring capabilities for all asset classes, programs and Total Fund
- Upgraded system now externally hosted and covered by a managed service arrangement
- Improved the risk reporting for Private Equity and Real Assets

Major Accomplishments for 2011/12 (continued)

Private Equity Portfolio Management System and Accounting and Data Services: New accounting service, comprehensive data services and portfolio management/analytic solution for Private Equity

- Completed comprehensive solution requirement analysis, and released two RFPs
- Designed a single accounting and data solution to support both INVO and Fiscal's business needs
- Accelerated this project to respond to Private Equity business needs
- Vendor selection expected March 2013, followed by contract negotiations projected for completion June 2013, implementation TBD

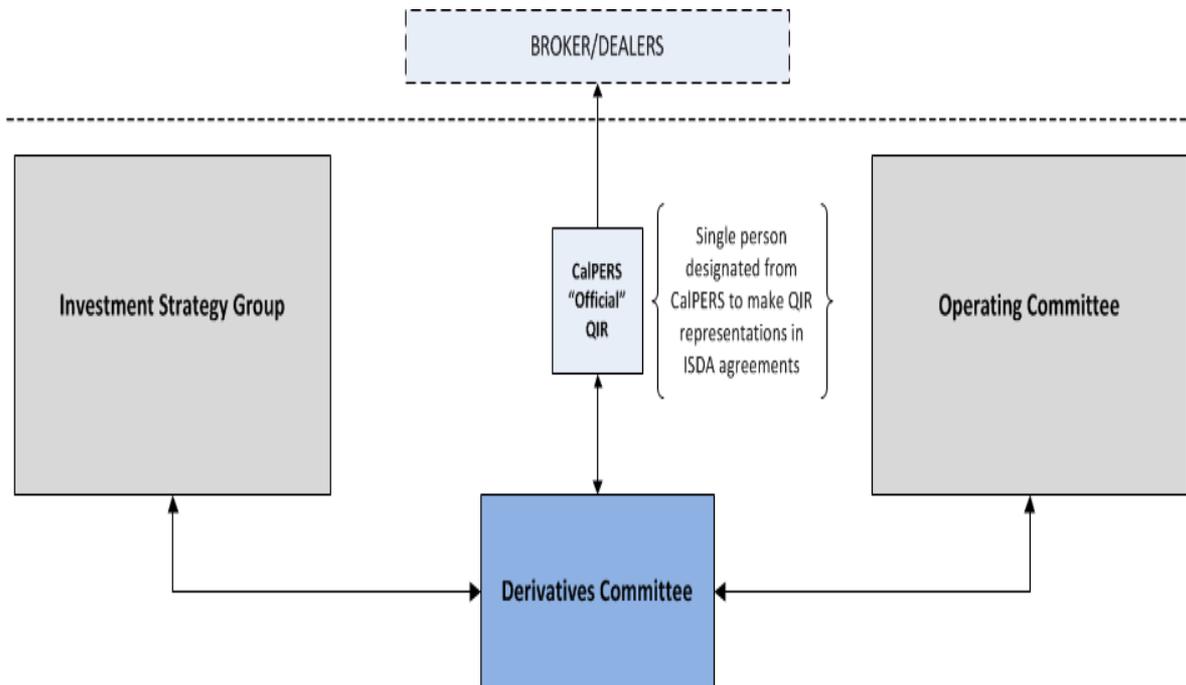
INVO Expense Management: Partnered with Financial Office (FINO) to design and build investment expense tracking and reporting solution that leverages enterprise application and Fiscal staff expertise

- Implemented INVO program specific expense tracking process
- Designed management and financial reports for INVO senior staff use
- Piloted investment cost reporting in support of the One Budget framework
- Identified gaps in automated expense capture and working towards capture of all expenses

Derivatives Central Clearing: Comprehensive analysis of Dodd Frank Act (DFA) implications for CalPERS trading

- Engaged legal counsel to assess CalPERS status under the DFA, identified key requirements for CalPERS to meet mandatory clearing and other DFA requirements, developed work-streams and project timeline, and began implementation of key operations and technology components necessary for clearing
- Completed analysis of Dodd Frank Business Conduct rules, drafted internal policies and procedures in response, and developed a Derivatives Committee framework
- Current projected mandatory clearing date for CalPERS is August 2013

Derivatives Central Clearing – Qualified Independent Representative



- Under the DFA, CalPERS is classified as a non-ERISA "Special Entity"
- The CFTC and SEC have enacted Business Conduct Rules that specify how Dealers and Major Swap Participants must interact with non-ERISA Special Entities such as CalPERS
- Investment Office will need to establish a Qualified Independent Representative (QIR) who attests to Broker/Dealers that proper internal market knowledge, policies and controls are in place to protect CalPERS interest
- Investment Office is creating a formal Derivatives Committee, which would receive delegated authority to act as QIR and establish a framework for derivatives oversight, policy creation and new product trading approval
- The QIR Committee will be chaired by an SIO who is designated as a QIR. Voting members will be senior participants from Global Fixed Income, Global Equity and Absolute Return Strategies

Enterprise Risk Heat Map

Investment Controls and Systems are Red on the Enterprise Risk Heat Map:
<ul style="list-style-type: none">• Enterprise Risk rating was assigned based on INVO's Risk Heat Map• Launched TOM initiatives to address and mitigate top risks
How INVO migrates to Yellow:
<ul style="list-style-type: none">• Completion of the PM2 Project• Implementation of the Private Equity Portfolio Management System and Private Equity Accounting and Data Collection Services• Full implementation of INVO expense tracking and reporting• Establish investment compliance monitoring program• Develop more robust performance analysis and attribution capabilities• Estimated completion end FY 2013/14
How INVO migrates to Green:
<ul style="list-style-type: none">• Materially complete all initiatives identified in the refreshed Target Operating Model• Optimistic completion date FY 2014/15

Factors that impact the speed of delivery:

- INVO's ability to recruit and fill key leadership positions
- Dependency issues, such as the need to sequence initiatives so they build and support each other
- Organizational bandwidth: There are limits on the amount of change INVO can absorb

Summary

Evolution of Target Operating Model

- 2010: INVO performs Risk Assessment / Heat Map and launches TOM work
- 2011/12: Either completed or significantly advanced 6 of the highest priority projects identified by TOM
- 2012: Launched Risk and TOM Refresh effort
- 2013-15: Complete the next set of prioritized initiatives

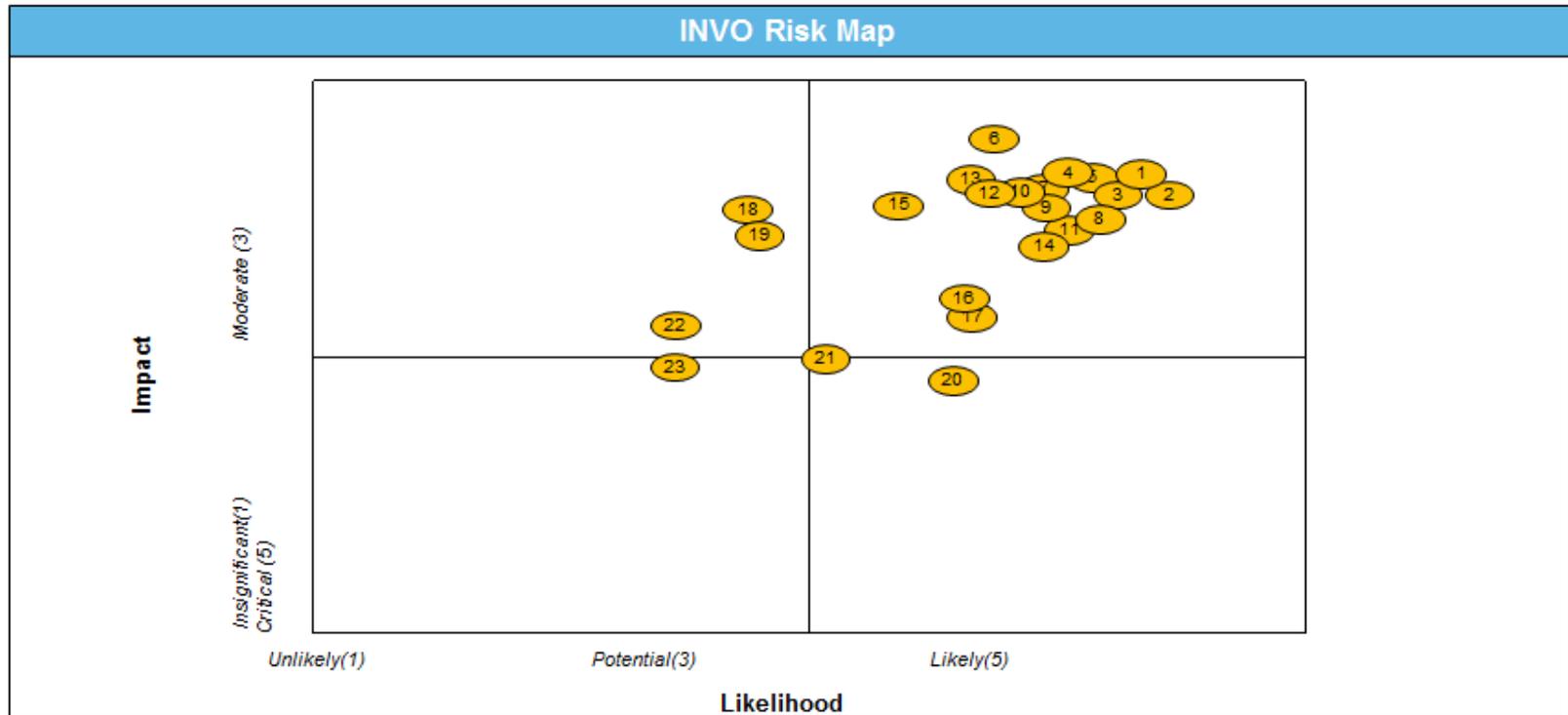
Next steps:

- November 5: Risk workshop
- December 2012: Prioritization of identified initiatives
- February 2013: refreshed TOM presented to Investment Committee

Appendix

- 2010 CalPERS INVO Risk Map & Rankings

2010 INVO Risk Map & Rankings



Risk Name			
1	Data Integrity	13	Asset Allocation Strategy / Portfolio Structure
2	Portfolio Data & Analytics	14	Recruiting & Retention
3	Control Environment	15	Liquidity
4	Ext. Manager / Partner Selection, Monitoring & Rights	16	Incentive Alignment
5	Governance / Stakeholder Support & Influence	17	Contract Management
6	Market / Systemic	18	Defined Benefit Viability
7	Investment Decision Process	19	Ethics / Fraud
8	External Influence	20	Institutional Knowledge
9	Business Model	21	Interest Rates
10	Skills & Capabilities	22	Counterparty
11	IT Infrastructure Adequacy	23	Currency / Foreign Exchange
12	Leadership / Direction		

2010 INVO Risk Map & Rankings

Rank	Risk Name	Like	Imp.	Risk Ranking
1	Data Integrity: Lack of timely, reliable and high-quality data to perform analyses and drive appropriate action and decisions	4.4	4.3	18.9
2	Portfolio Data & Analytics : Lack of data, information or insight concerning existing or potential holdings (public or private) needed to support capital allocation decisions and monitoring of portfolio performance	4.5	4.2	18.9
3	Control Environment: Violation of existing policy by employees or partners; or lack of processes or procedures to ensure compliance with existing policies; or lack of appropriate separation of duties and effective controls in operating processes	4.3	4.2	18.1
4	External Manager / Partner Selection, Monitoring & Rights: Inability to select, oversee and structure contracts and incentives with external managers to deliver results that satisfy the organization's objectives and allow for mitigation of potential investment risks	4.1	4.3	17.6
5	Governance / Stakeholder Support & Influence: Inability to align key stakeholders (e.g., management, Board, members, CalPERS enterprise, and consultants) around strategic objectives for INVO and to ensure stakeholder support for the execution of those objectives	4.1	4.3	17.6
6	Market / Systemic: Significant and / or unexpected change in investment performance driven by market factors	3.8	4.6	17.5
7	Investment Decision Process: Lack of a comprehensive investment decision making framework and process that ensures appropriate cross-functional discussion, input, action, and review and that delineates clear and consistent roles and responsibilities	4.0	4.2	16.8
8	External Influence: Lack of ability to execute activities that support long-term strategic goals and investment performance objectives due to undue influence by or potential influence by external stakeholders and special interests	4.2	4.0	16.8
9	Business Model: Inability, as a state agency, to operate, compete and build a reputation as a world class investment manager	4.0	4.1	16.4
10	Skills & Capabilities: Lack of key business, investment management and / or technical expertise necessary to run the organization and ensure the appropriate division of in-house vs. outsourcing of skills, functions and expertise	3.9	4.2	16.4
11	IT Infrastructure Adequacy: Lack of appropriate, integrated information management systems to support timely and accurate collection / analysis of data and execution of business processes	4.1	3.9	16.0
12	Leadership / Direction: Inability to maintain clear and consistent direction from senior management regarding key priorities, activities and objectives; inability to implement functioning, governance / decision-making structure within INVO	3.8	4.2	16.0
13	Asset Allocation Strategy / Portfolio Structure: Lack of ability to effectively and advantageously execute timely strategic and tactical asset allocation decisions that improve fund performance and reduce volatility	3.7	4.3	15.9
14	Recruiting & Retention: Inability to identify, attract, select, hire and retain appropriately skilled and experienced employees to execute the organization's activities and maintain a stable workforce	4.0	3.8	15.2
15	Liquidity: Inability to generate, maintain or access capital necessary to fund operations and meet obligations in either the short term (e.g. capital calls) or long term (e.g. retirement benefits); including the inability to convert certain investments to cash without significant loss of value	3.4	4.1	13.9
16	Incentive Alignment: Misalignment of individual and/or team (internal) performance expectations with the overall goals and performance objectives of the organization, portfolio or system	3.7	3.4	12.6
17	Contract Management: Inability to identify, catalog and manage contractual agreements in a consistent and effective manner in order to ensure compliance and monitor vendor performance	3.7	3.3	12.2
18	Defined Benefit Viability: Cessation of or significant change to the current defined benefit pension system in California	2.8	4.1	11.5
19	Ethics / Fraud: Improper behavior or unlawful action taken in pursuit of personal gain by employee(s) or others associated with or acting on behalf of the organization	2.8	3.9	10.9
20	Institutional Knowledge: Inability to design, maintain and execute processes and systems to ensure the documentation, transfer and institutionalization of business activities to ensure consistency and sustainability of operations	3.6	2.8	10.1
21	Interest Rates: Significant and / or unexpected change in interest rates associated with the organization's existing assets	3.1	3.0	9.3
22	Counterparty: Default on existing obligations by financial intermediaries (e.g. brokers, banks, fund managers), suppliers or bond issuers	2.5	3.2	8.0
23	Currency / Foreign Exchange: Significant and / or unexpected change in the value of the US dollar relative to foreign currencies held in or affecting the portfolio's other investments	2.5	2.9	7.3