



Supply Chain Risk Management (SCRM)

September 1, 2010

Bruce C. Arntzen, PhD

Director MIT GLOBAL Scale Risk Initiative

MIT E40-365, 77 Mass Ave
Cambridge, MA 02139

barntzen@mit.edu

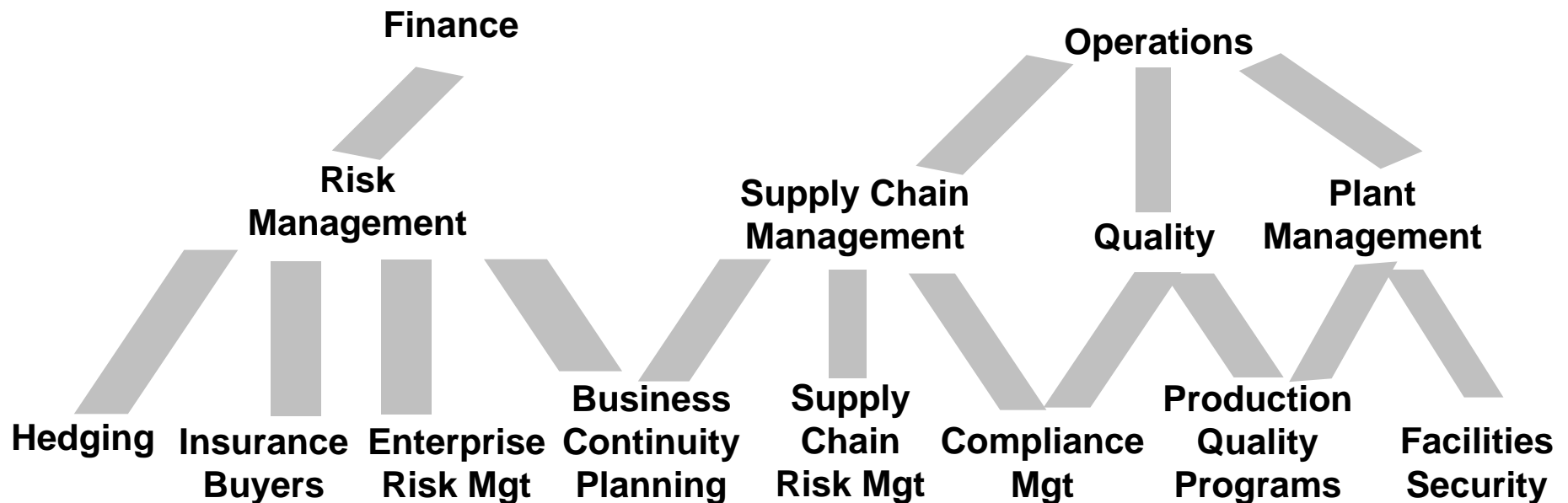
W 617-252-6965, M 978-793-1411



SCRM is beginning to catch on... slowly

Now we understand all the different facets of the company that are involved in SCRM. No wonder it is taking so long!

How is your company organized for SCRM?



Supply Chains going Global



People don't agree on much of anything.

Since people around the world don't agree on:

- Political systems
- Religion
- Human rights
- Race relations
- Environmental stewardship
- Animal rights



Why should they agree on:

- Product quality standards
- Need for On-time delivery
- Process Safety standards
- Excess Material Liability
- Risk Prevention Investments
- Emergency Preparedness

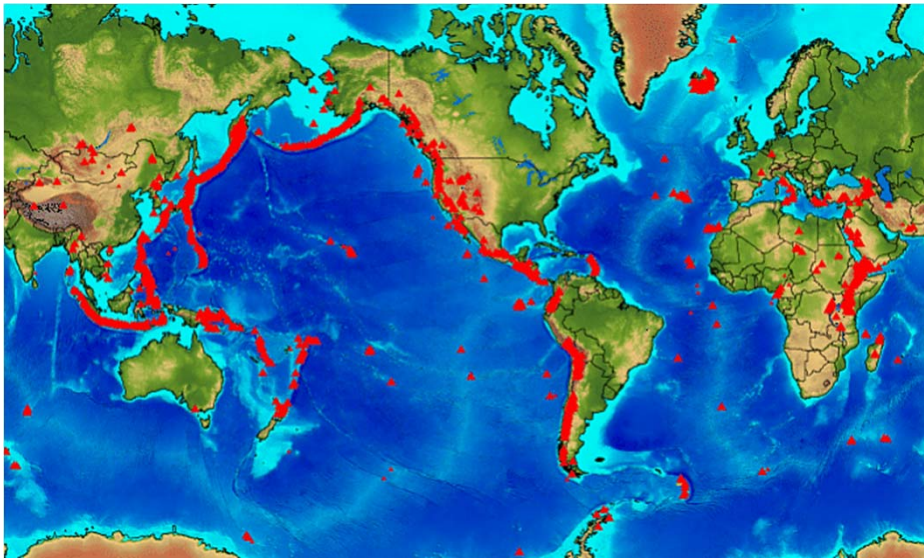


What could go wrong?

SCRM has gotten a lot of press lately!



Different Risks in Different Regions



Heat Map of Volcanoes

SMITHSONIAN INSTITUTION, GLOBAL VOLCANISM PROGRAM

Heat Map of Hurricanes

Federation of American Scientists,
Remote Sensing Tutorial Section 14
Primary Author: Nicholas M. Short



Survey questions

INDEPENDENT VARIABLES

Experiences

- risk frequencies
- disruption frequencies

Personal Background

- country & setting
- languages
- age, gender

Job Info.

- function & level
- years on the job

Company Info.

- industry
- size of company

DEPENDENT VARIABLES

Opinions

- prevention v. response
- planning v. doing
- central v. local
- alignment of suppliers' attitudes
- most important risks
- most important disruptions

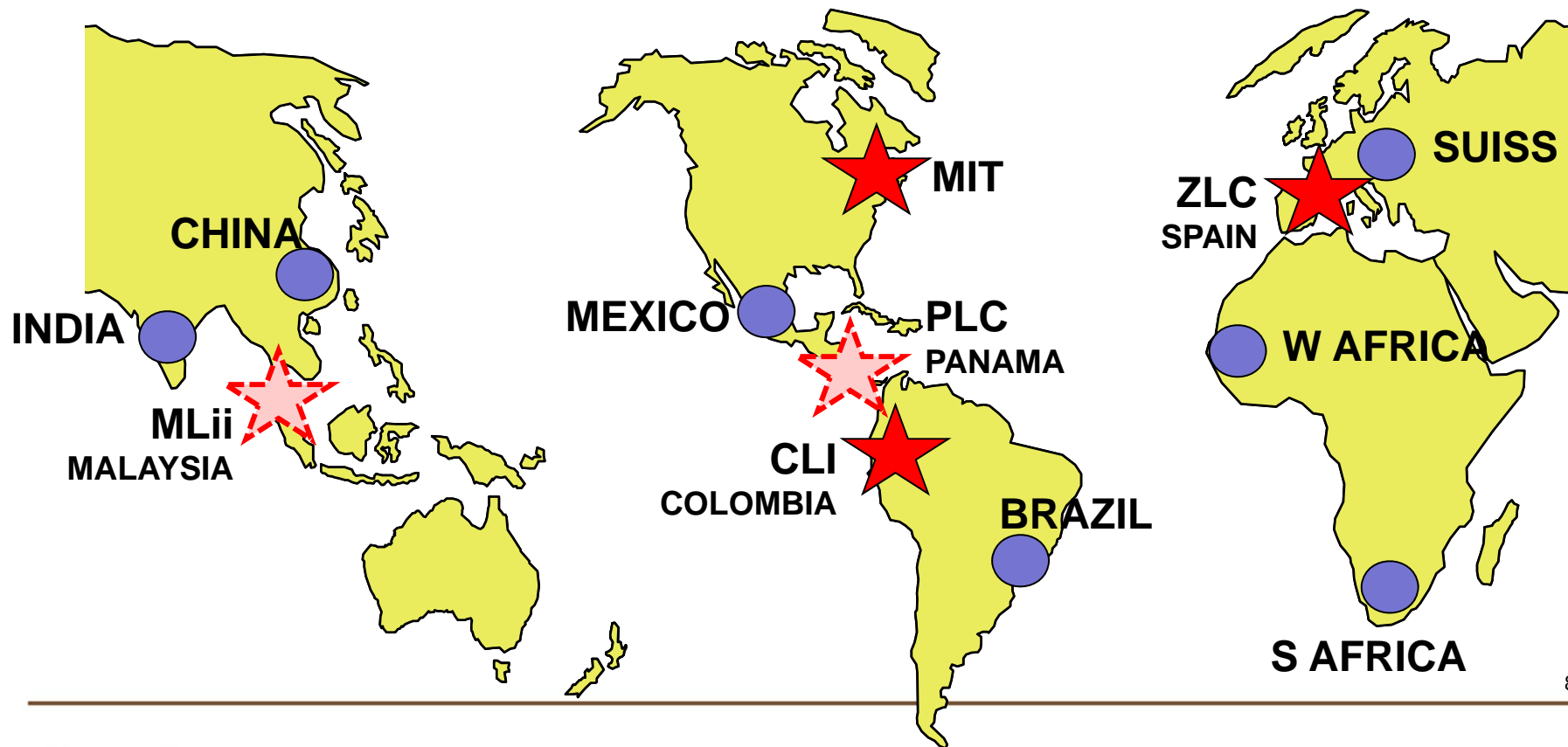
Risk Mgt Practices

- effectiveness of risk mgt
- role of risk mgr (or BC mgr)
- risk mgt programs
- involvement of suppliers
- involvement of customers
- engagement with law enforce.

Survey Teams

MIT Network of Centers: existing  under development 

Team from other Universities and companies: 

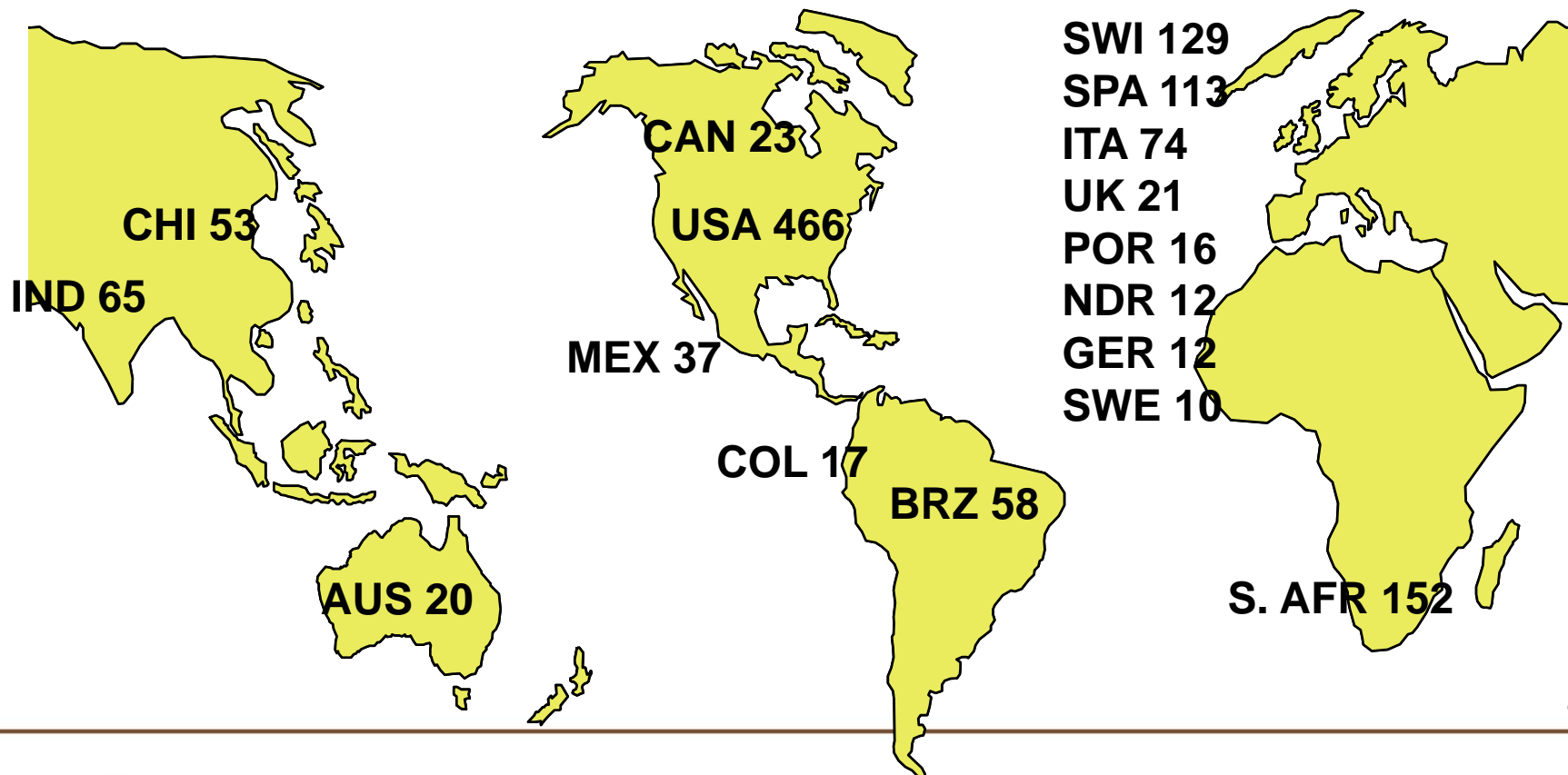


Survey responses

Target audience:

- Supply chain & business managers
- Manufacturers, Retailers, Distributors

- A total of 2,434 people started the survey
- 1,461 people from over 70 countries completed the survey
- Significant responses (10+) from 17 countries shown below
- Mixture of “Supplier countries” and “Consumer countries”



Look & Feel of the Survey

**On-line
Survey Monkey
12 minutes**

MIT Global Risk Initiative -- Survey of Supply Chain Risk Management -- SN1

3. Supply Chain Risks

1. INTERNAL EVENTS

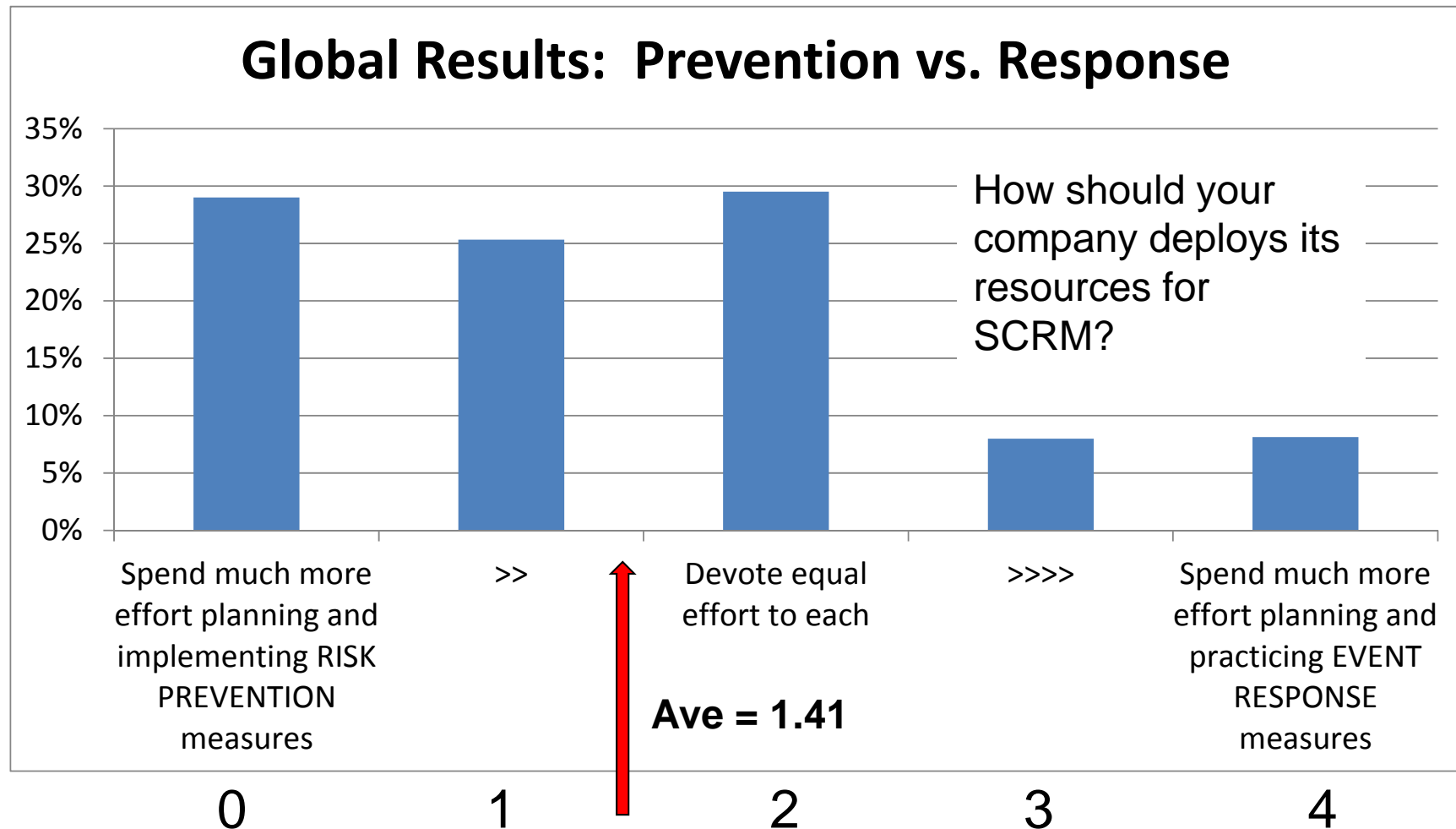
How often has your supply chain (at your site) been disrupted by these events?

Consider only MAJOR disruptions.

	Never	Rarely	About Yearly	Weekly or Monthly	Almost Daily	N/A
Spike in energy costs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inventory write-off due to new design change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cash crisis due to customers delaying payment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Price collapse due to a new competitor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sales collapse due to a new competing product	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cash crisis due to sudden drop in credit rating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spike in raw material costs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Raw Material supplier failure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Finished Goods manufacturing failure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transportation carrier failure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product Quality Failure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Failure of major software systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employee theft and executive misdeeds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (list below)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

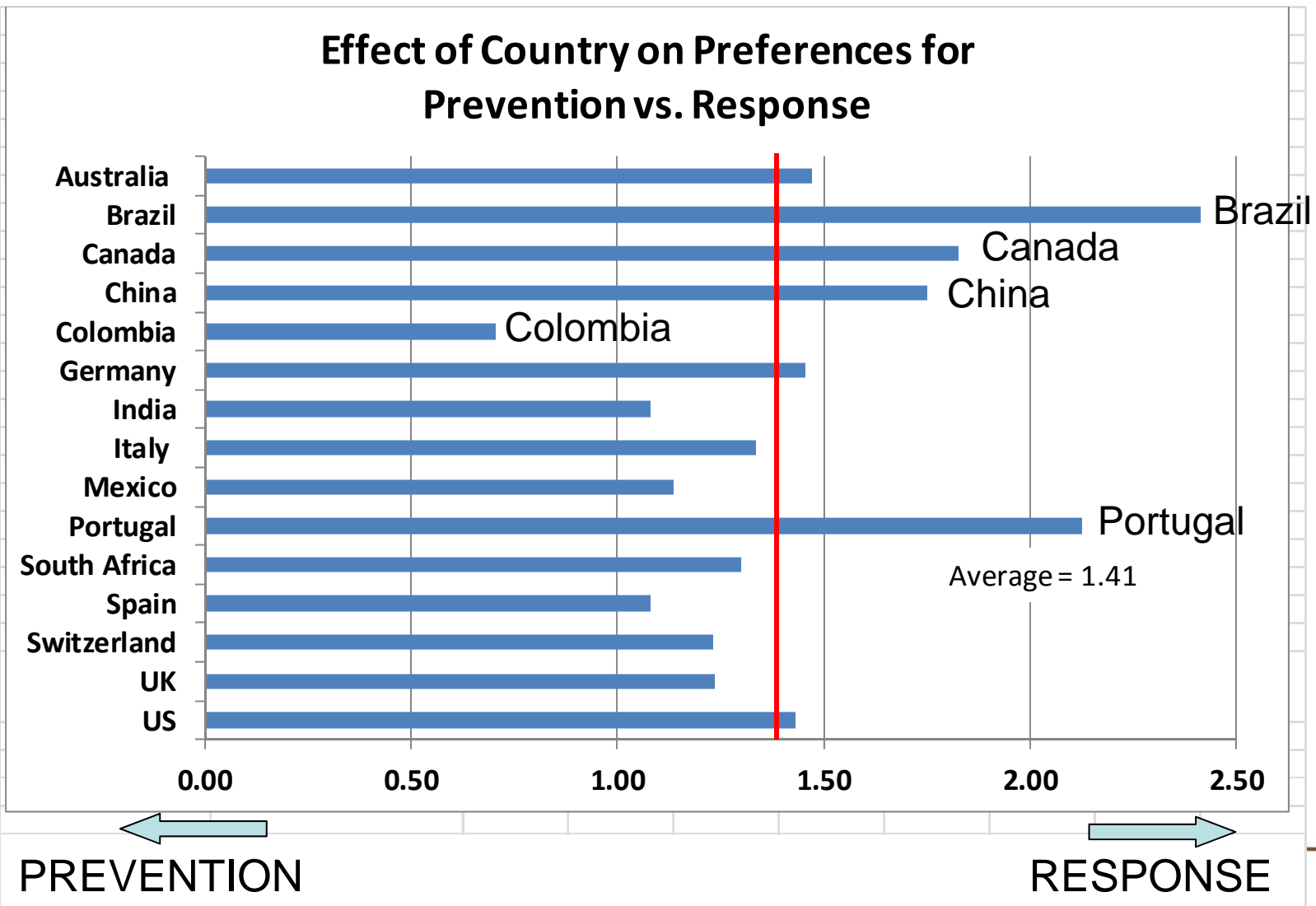
10

Prevention vs. Response

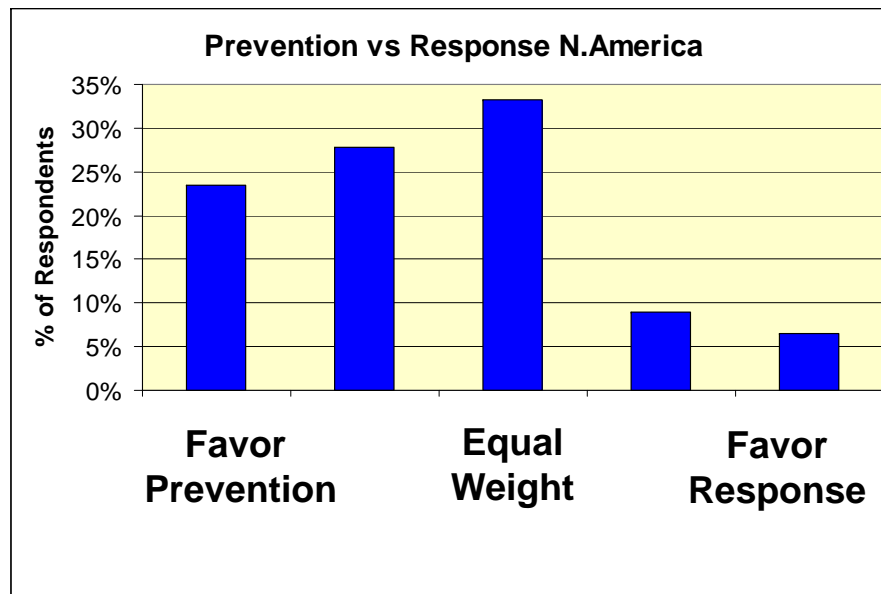


11

Prevention vs. Response by Country

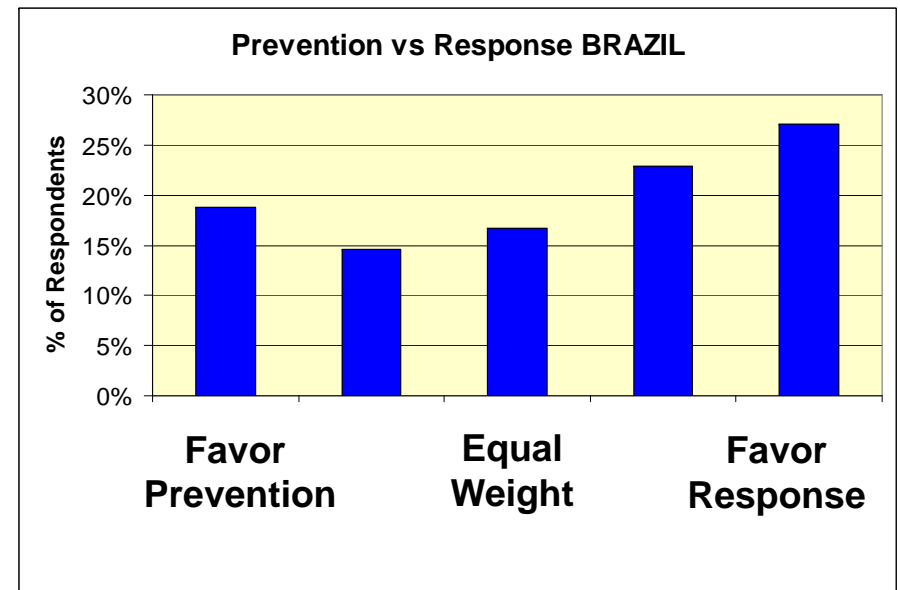


Prevention vs. Response: N. America v Brazil

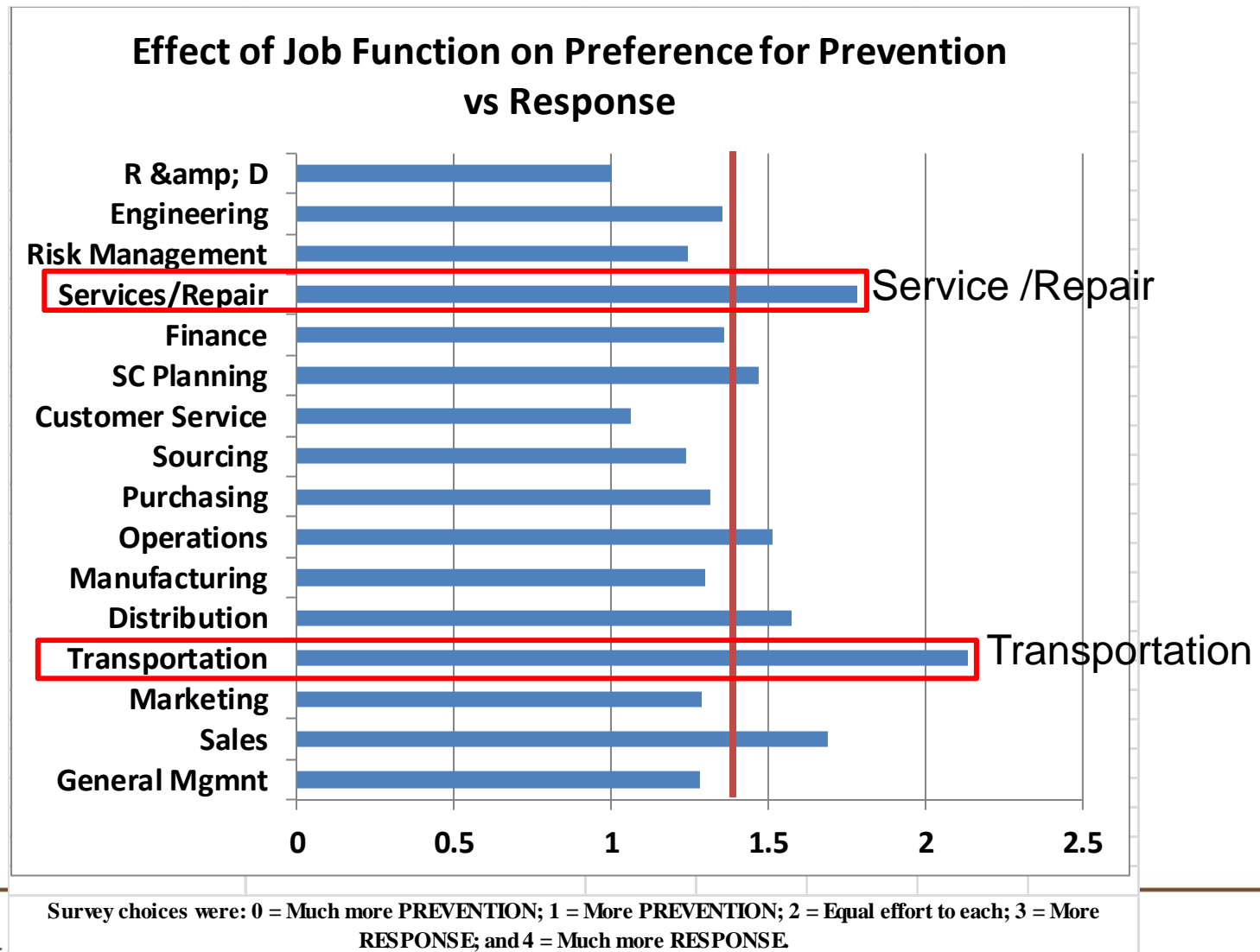


North America

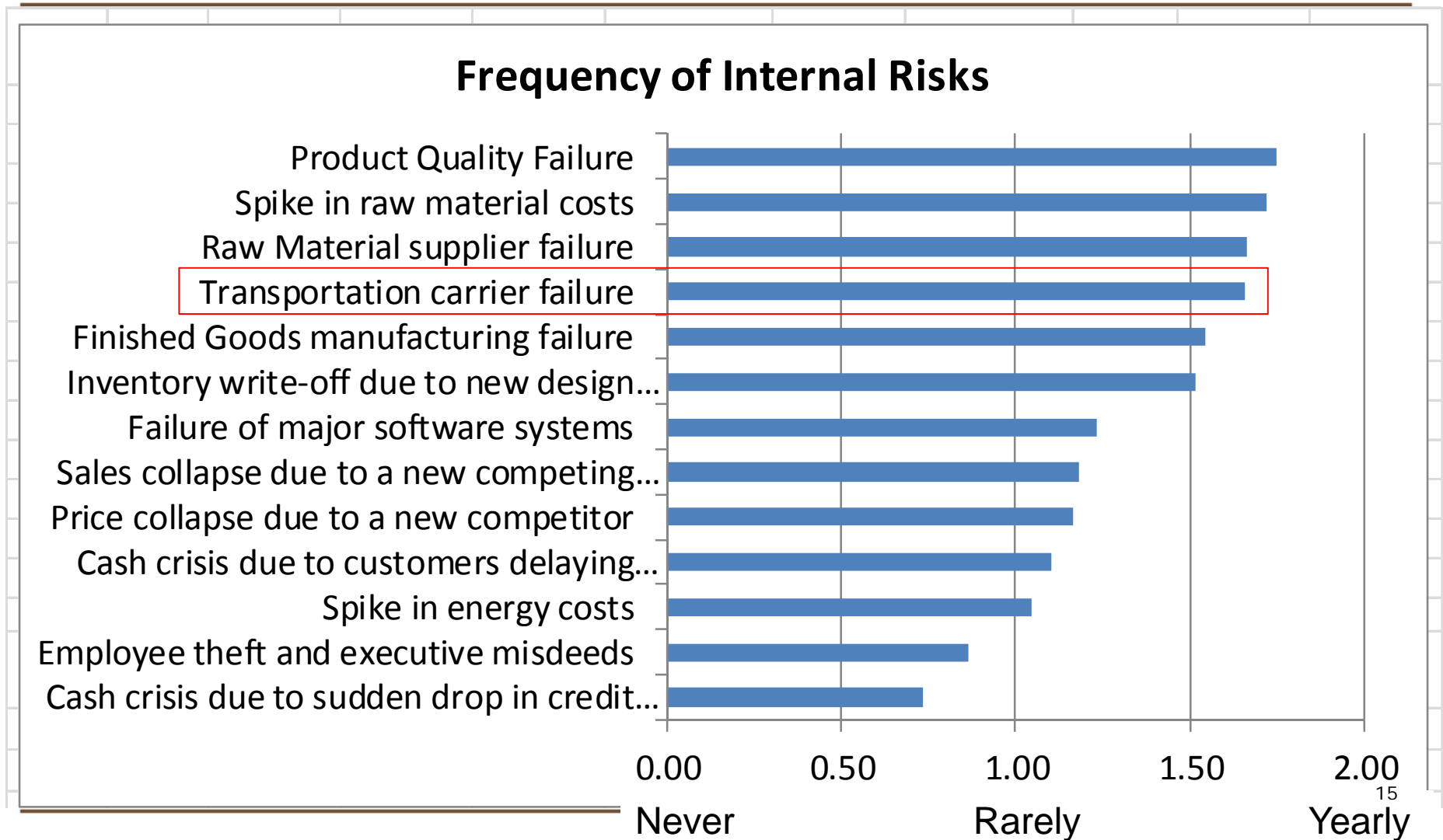
Brazil



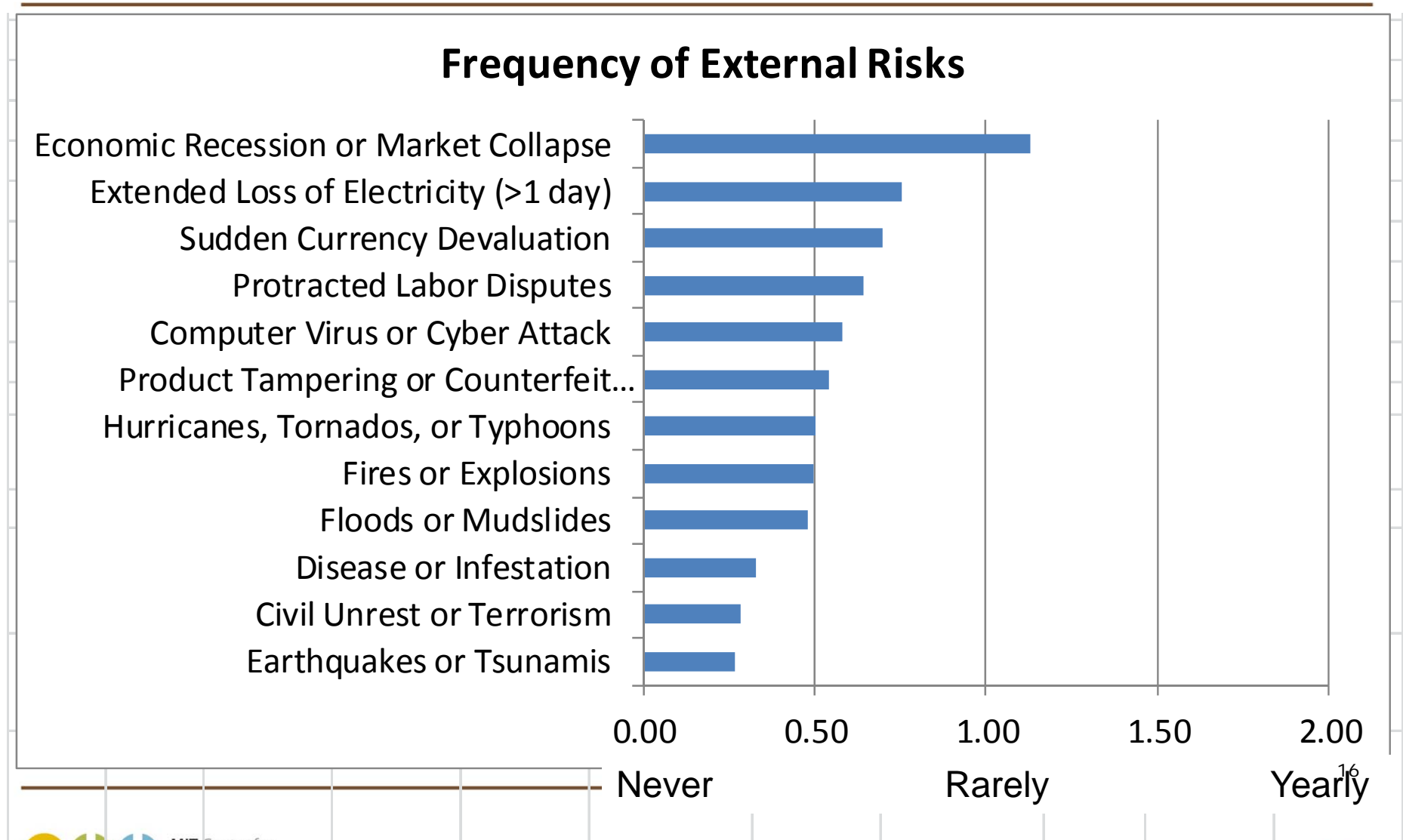
Prevention vs. Response by Job Function



Survey Results: Frequency



Survey Results: Frequency



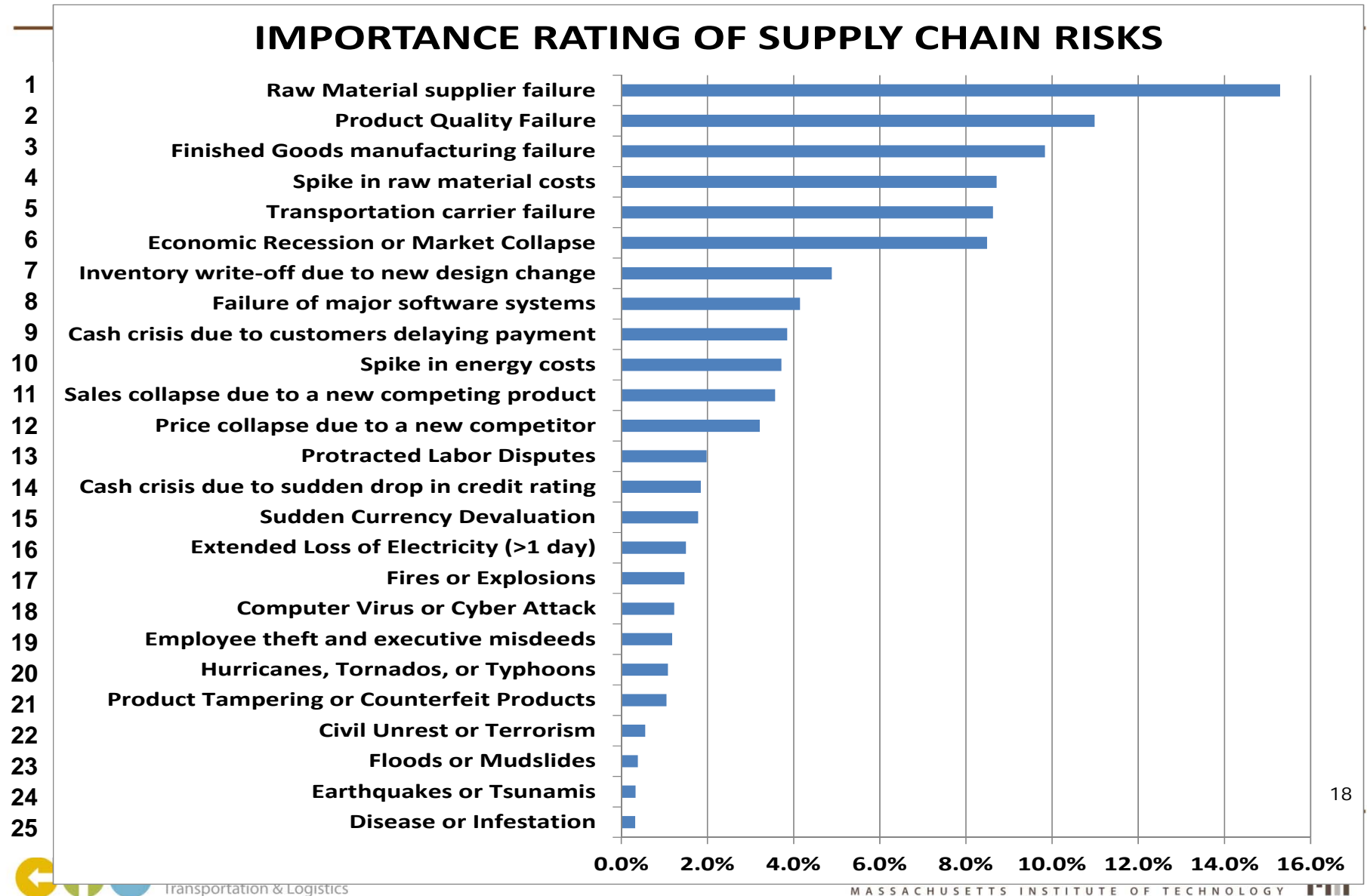
Risk Frequency Differences by Country

Country	High Frequency Risks (Red dots)	Risk Index*
Mexico	Hurricane, Earthquake, Mudslide, Infestation	15
Brazil	Floods & Mudslides	5
China	Typhoons, Earthquakes	10
India	Civil Unrest & Terrorism	9
Mid- East	Civil Unrest & Terrorism	10
South Africa	Extended loss of Electricity, Protracted Labor Disputes	11
West Africa	Spikes in Energy Cost, Extended Loss of Electricity	16

* 2 points for every Red dot, 1 point for every Yellow dot.

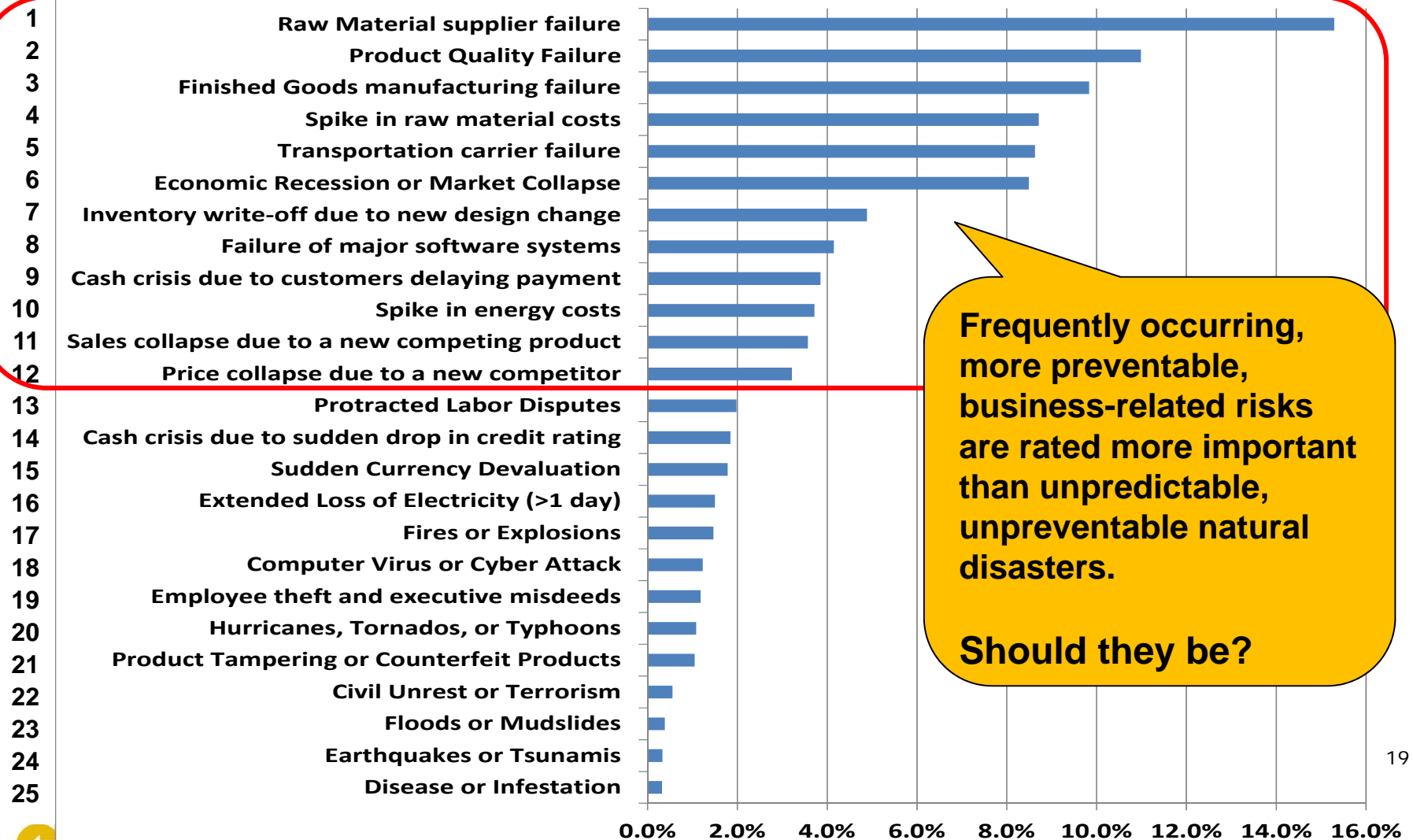
17

Survey Results: Importance Ranking



Risk Comfort Zone

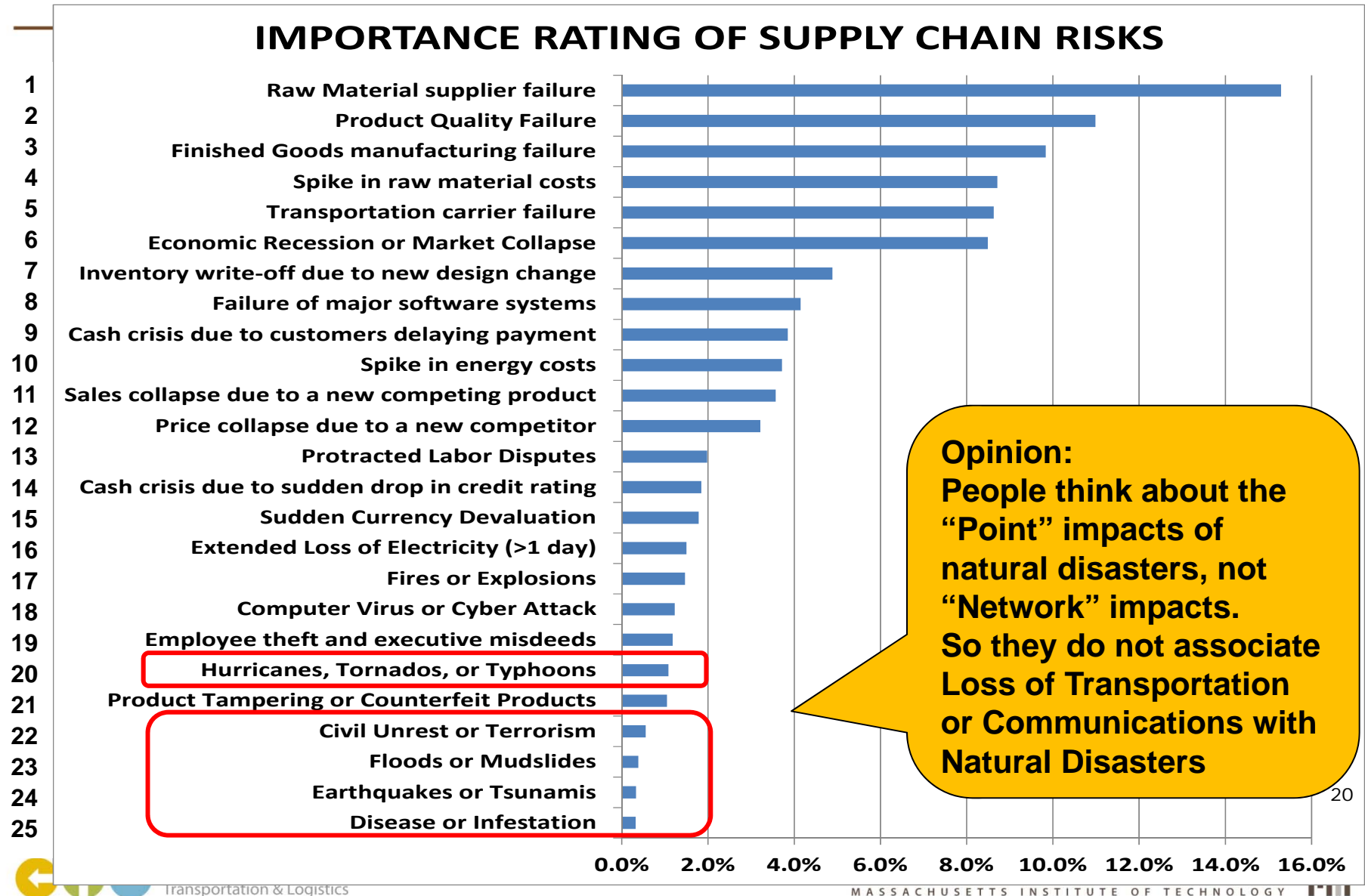
IMPORTANCE RATING OF SUPPLY CHAIN RISKS



Frequently occurring, more preventable, business-related risks are rated more important than unpredictable, unpreventable natural disasters.

Should they be?

Narrow View of Big Disasters



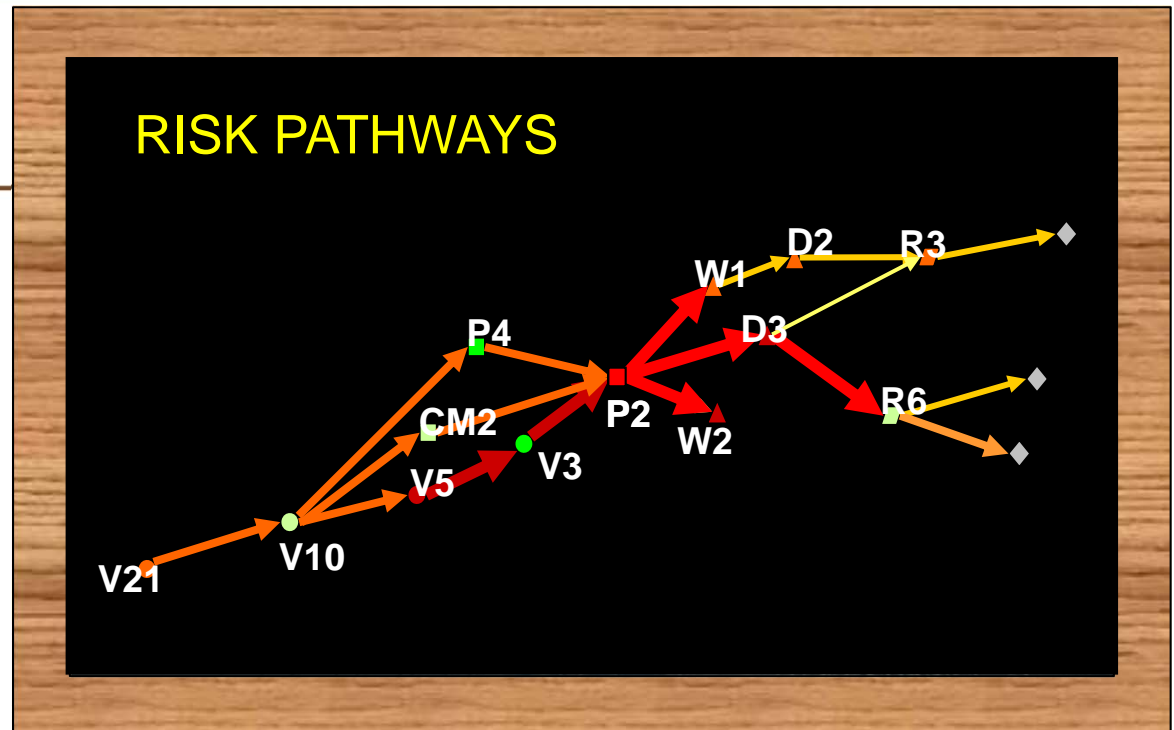
Three things to do:

- 1. Get out of your Risk Comfort Zone**
- 2. Think about Network Impacts, not just Point Impacts**
- 3. Talk to your suppliers and customers now!**

10/26/2010

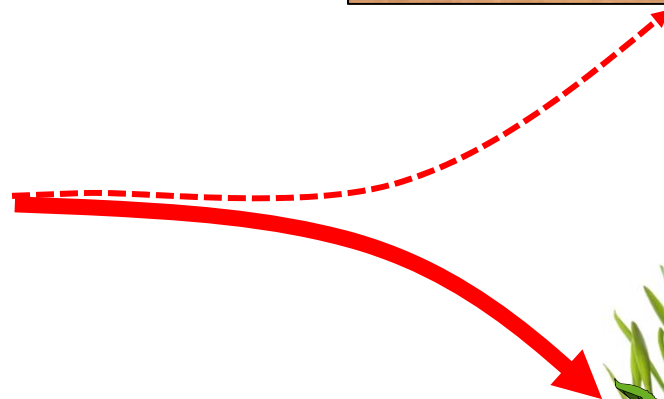
Business Need

How to efficiently identify and visually display the weakest link in the supply chain?



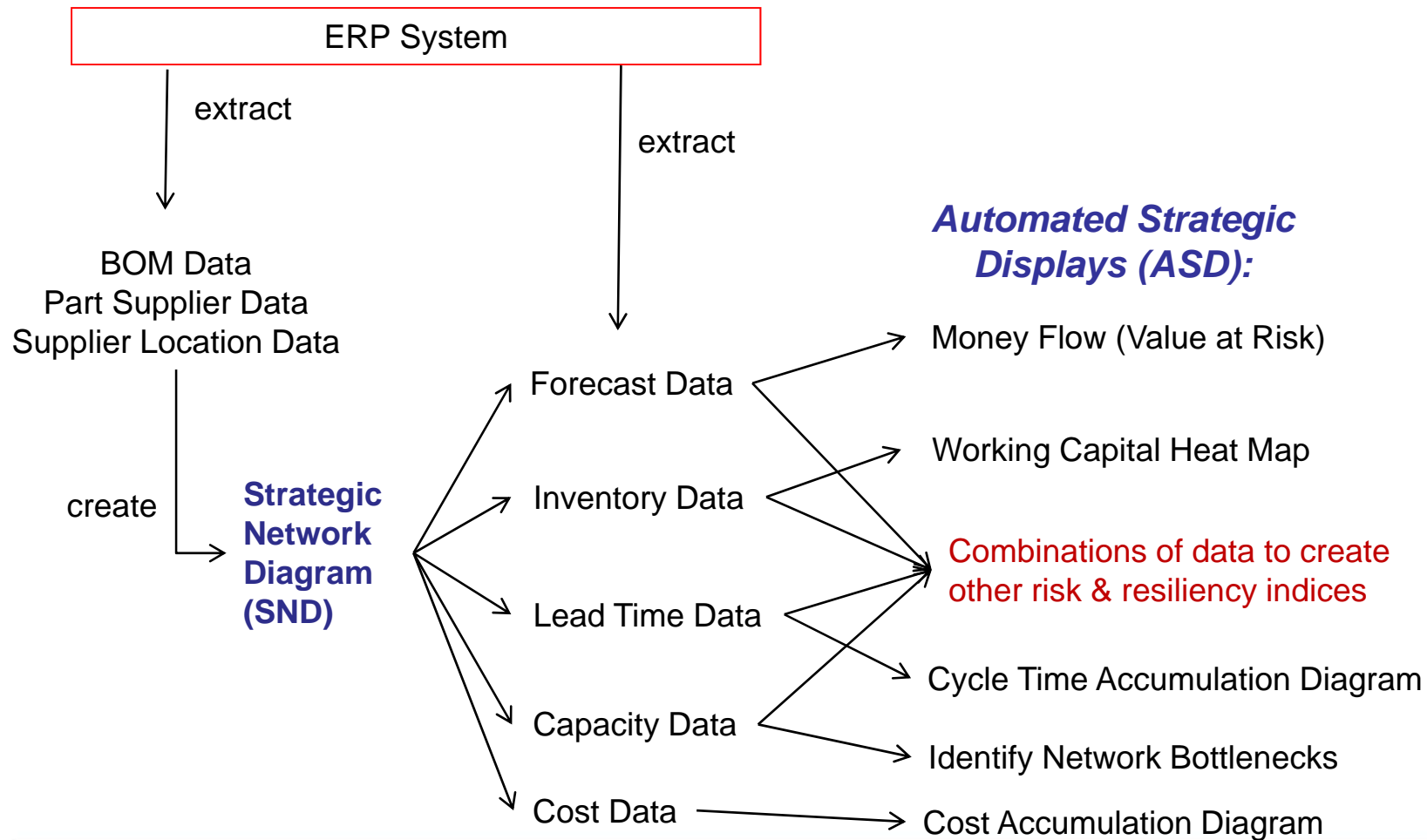
The Big Picture

SC Risk
Managers



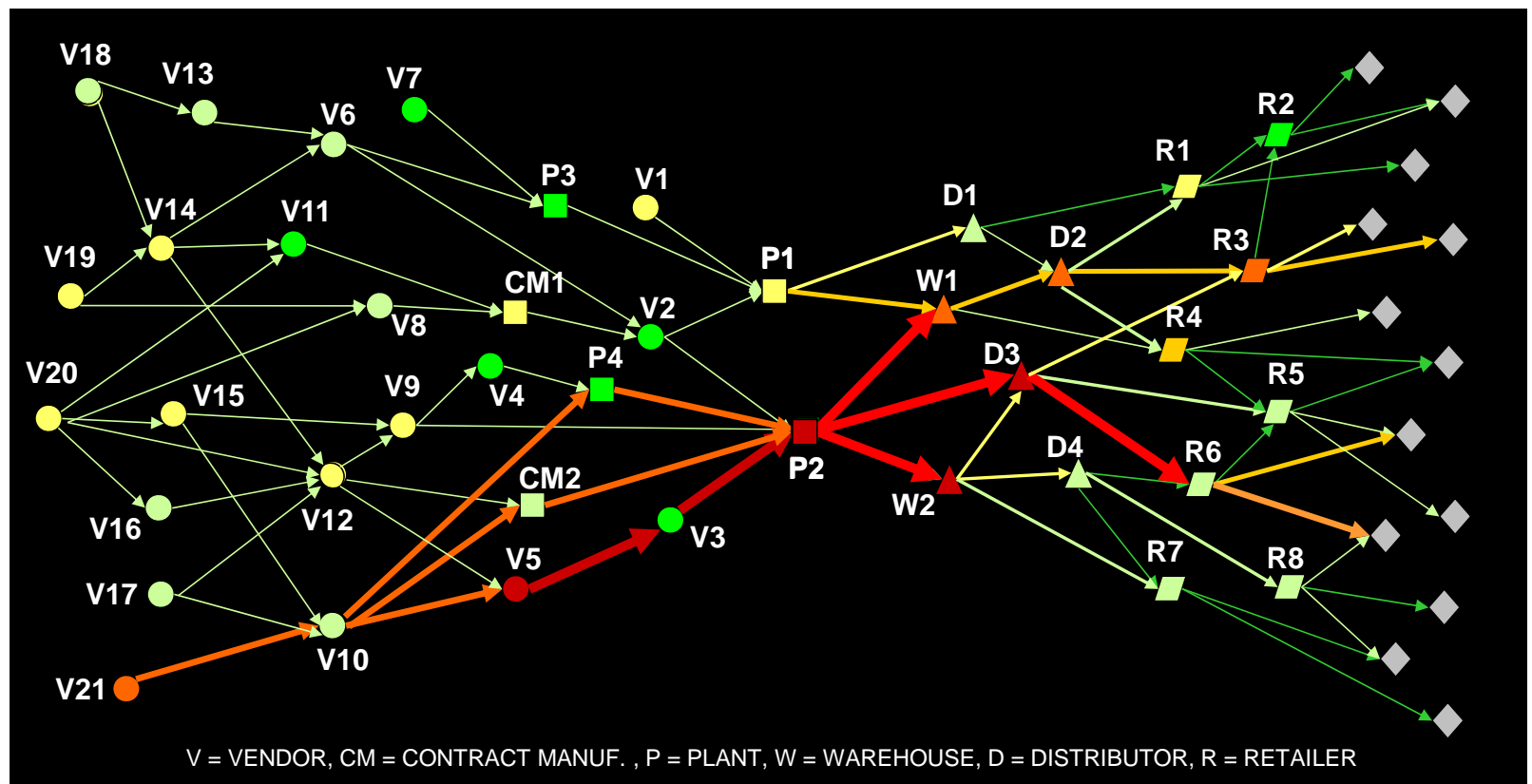
The Weeds

Potential uses of the Strategic Network Diagram



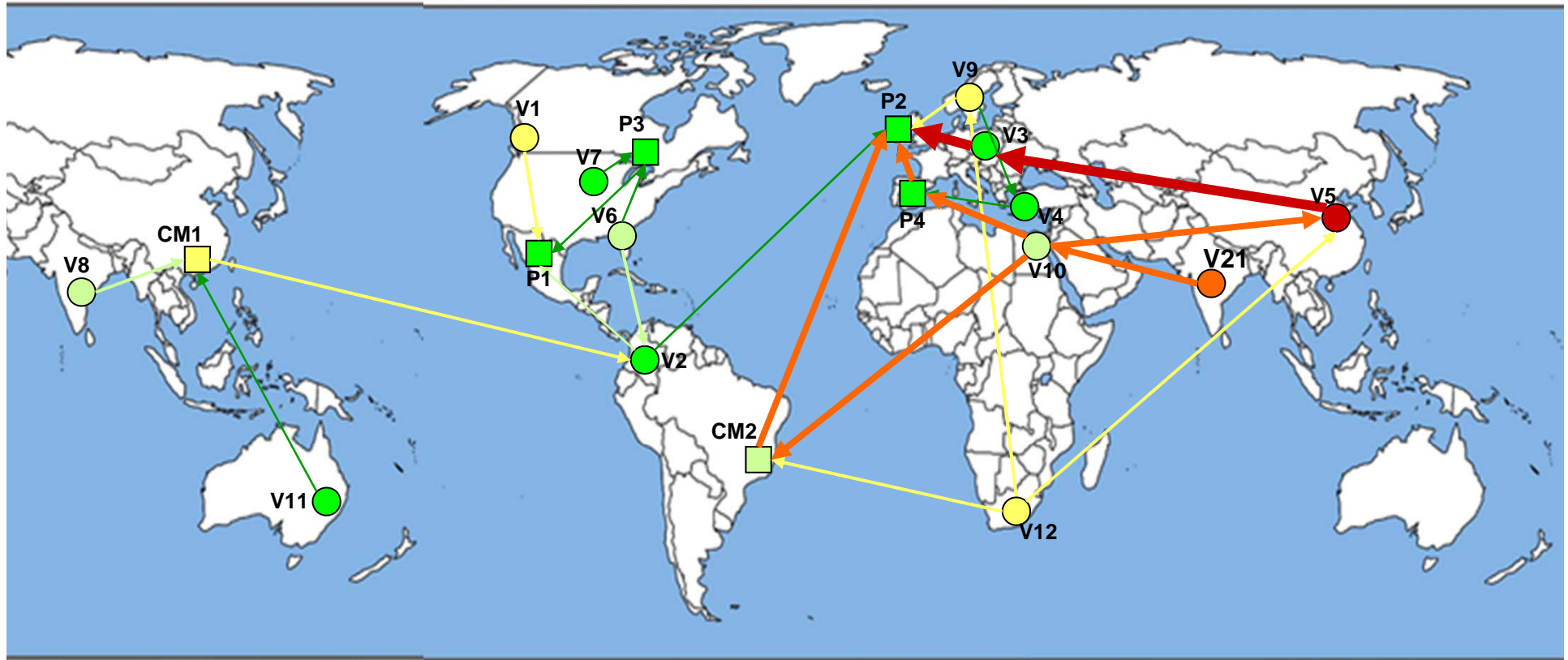
Automated Strategic Display – Network Diagram

Value at Risk over Recovery Time



Geographic Display of Risk Pathways

"Expected Loss Over Recovery Time"



EXPECTED LOSS OVER
RECOVERY TIME

Contributing Organizations

MIT would like to thank the many professional organizations, universities and companies who helped design, translate, and disseminate the survey to their constituencies:

Association for Operations Management (APICS)
Association for Operations Management of Southern Africa (SAPICS)
BWI Center for Industrial Management (ETH Zurich)
Center for Latin-American Logistics Innovation (CLI, MIT affiliate, Colombia)
Center for Transportation and Logistics (MIT)
Council of Supply Chain Management Professionals (CSCMP)
Expologistica (Mexico)
Global Supply Chain Council (China)
Imperial Logistics (S. Africa)
Institute for Supply Management (ISM)
Instituto de Empresa Business School (IE, Spain)
LOGyCA (Latin America)
School of Management in Fudan University (China)
Spanish Logistics Center (CEL-Logistica)
Supply Chain Council (SCC)
Synergia (India)
University of Bergamo (Italy)
Zaragoza Logistics Center (ZLC, MIT affiliate, Spain)

End of Presentation

Bruce C. Arntzen, PhD

Director MIT GLOBAL Scale Risk Initiative

MIT E40-365, 77 Mass Ave

Cambridge, MA 02139

barntzen@mit.edu

W 617-252-6965, M 978-793-1411

27