



Comparing the Economic Consequences of Three Disasters: Accounting for Fear and Perceived Risk

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Objectives

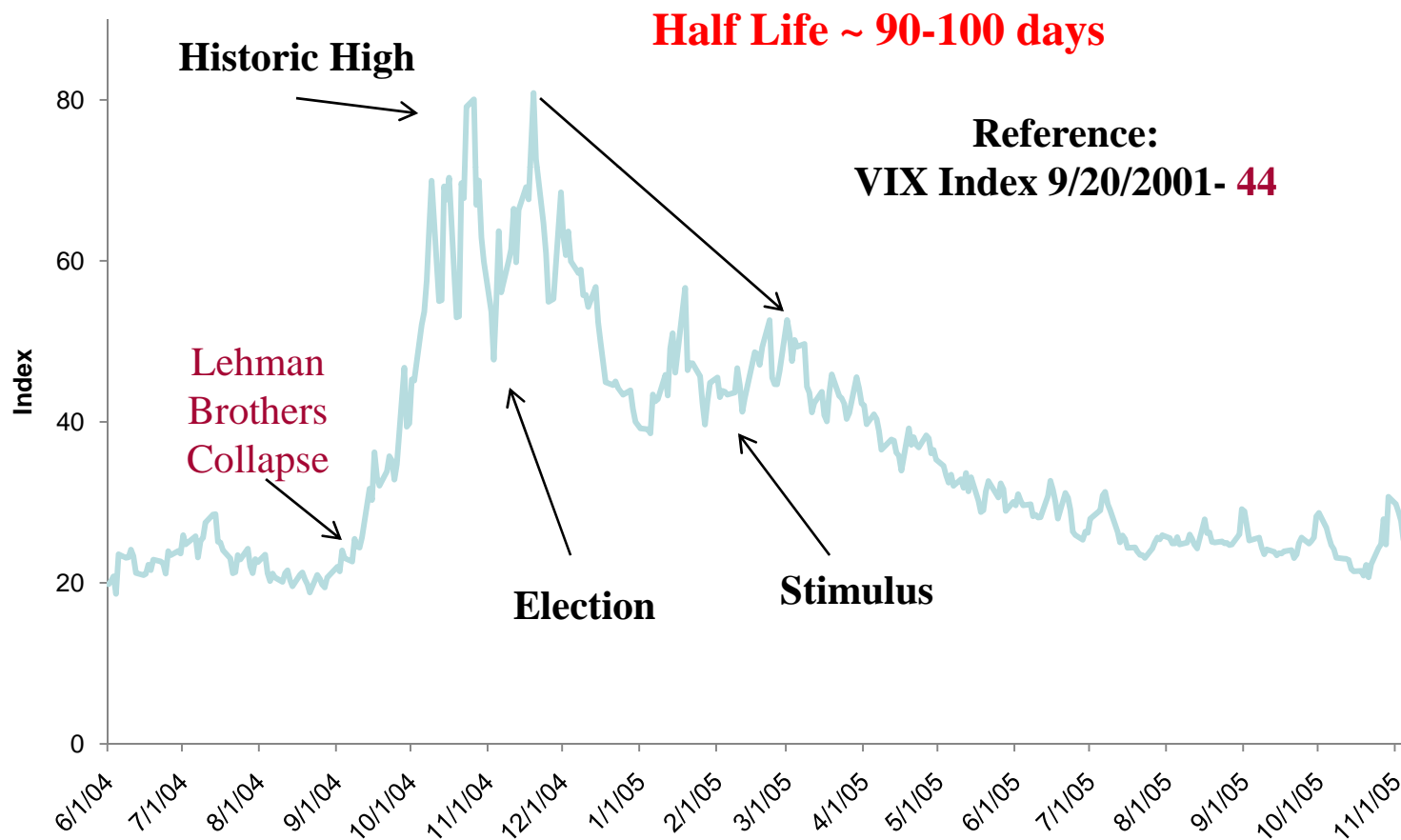
Disaster Scenarios:

How does **Perceived Risk** change over time?

Do **Event Characteristics** matter?

Can we estimate the **Economic Impacts of Risk Perception**?

Diffusion of Investor Fear Following Announcements of “Potential Financial Meltdown”¹: VIX Index



1: <http://finance.yahoo.com>.

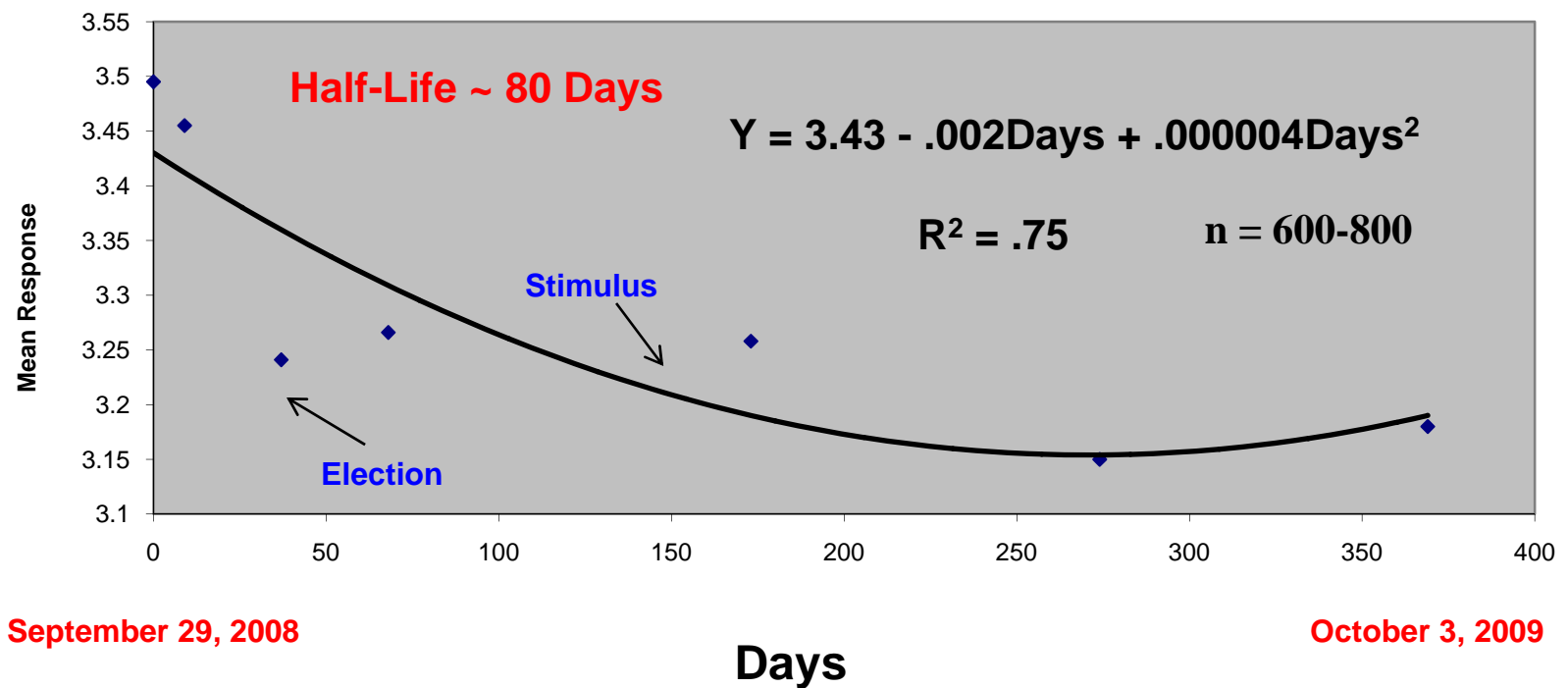
Retrieved November 6, 2009

Risk Perception: “Decay Rate”

Risk Perception Index: **Job, Savings, Investments, Retirement**

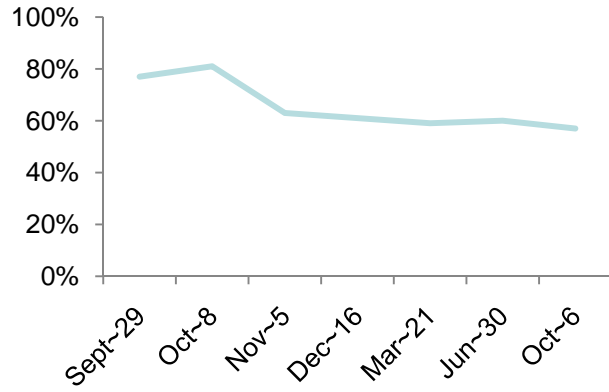
Very low risk (1)

Very high risk (5)

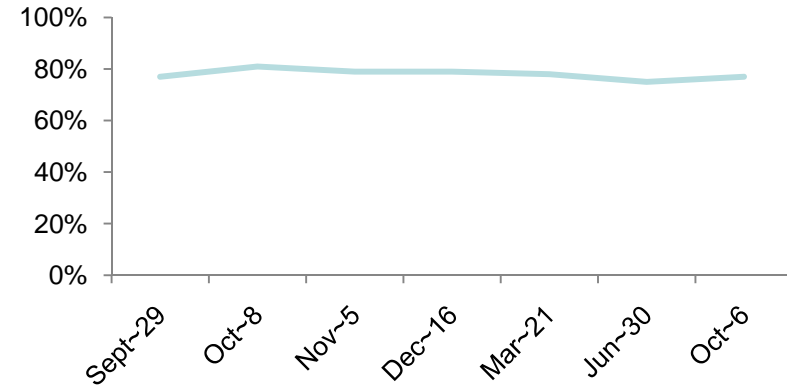




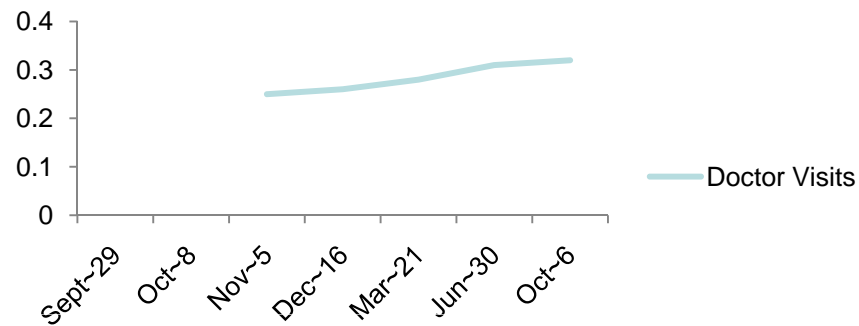
Worried about Money Yesterday



Postpone Large Purchases

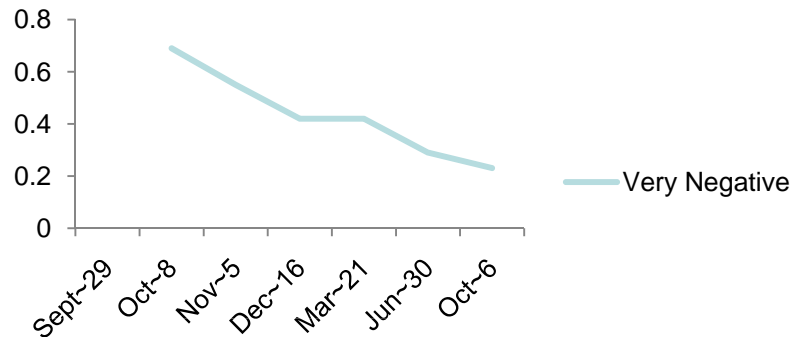


Postpone Doctor Visits

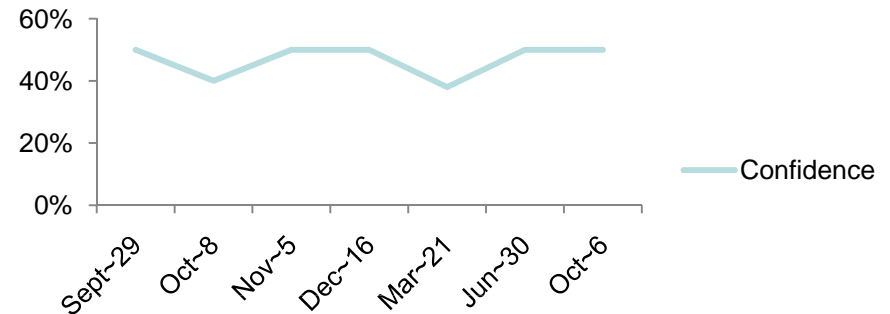




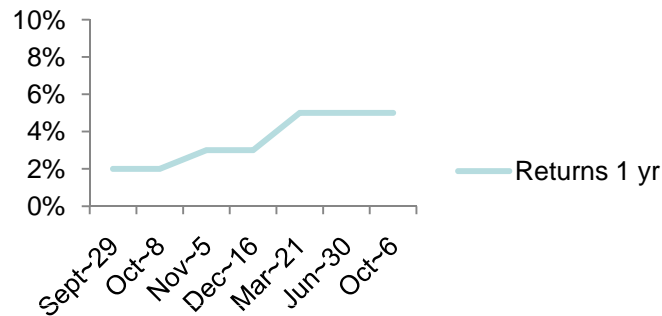
**Perceptions of Wall Street
(Very Negative)**



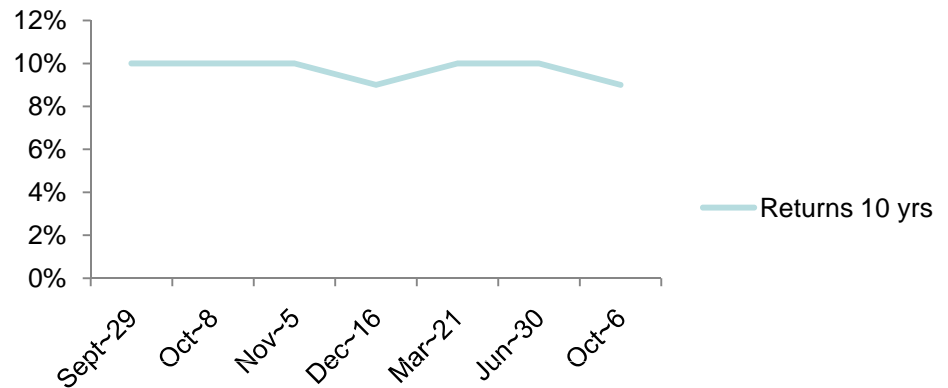
Confidence In Stock Market (0-100%)



**Expected Returns One
Year**



Expected Returns Ten Years

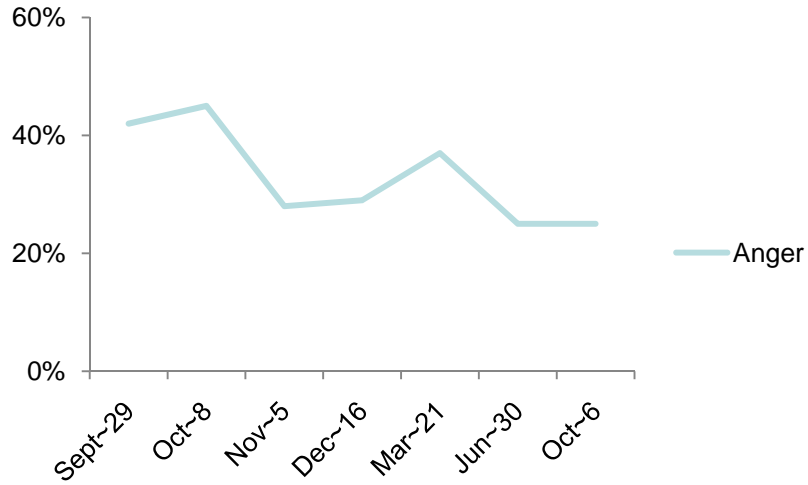


n = 413 completed all 7 waves

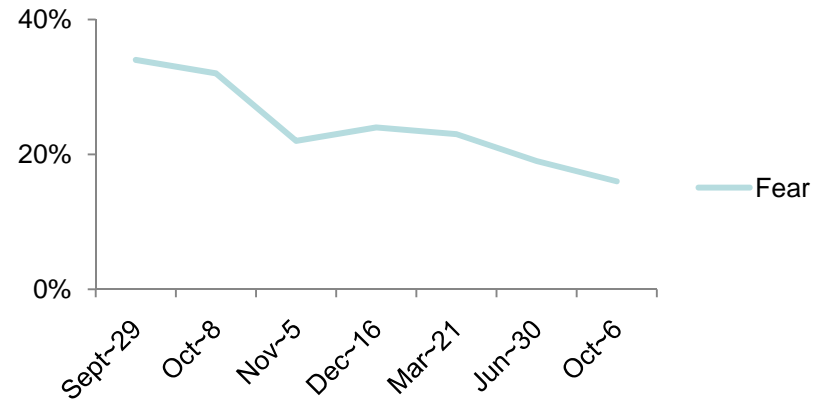
n = 936 overall



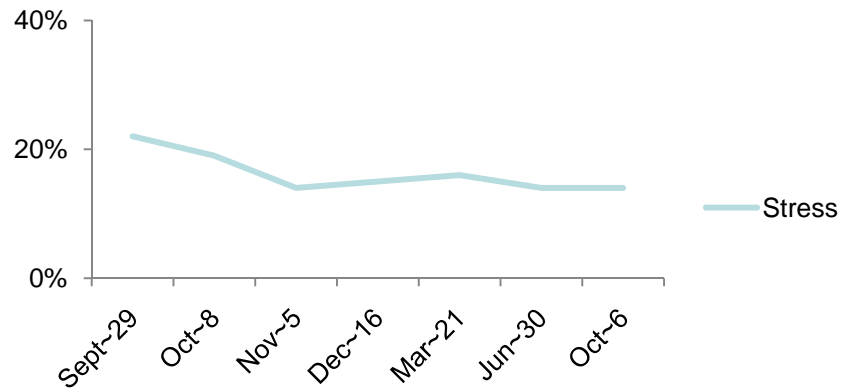
Very High Anger



Very High Fear

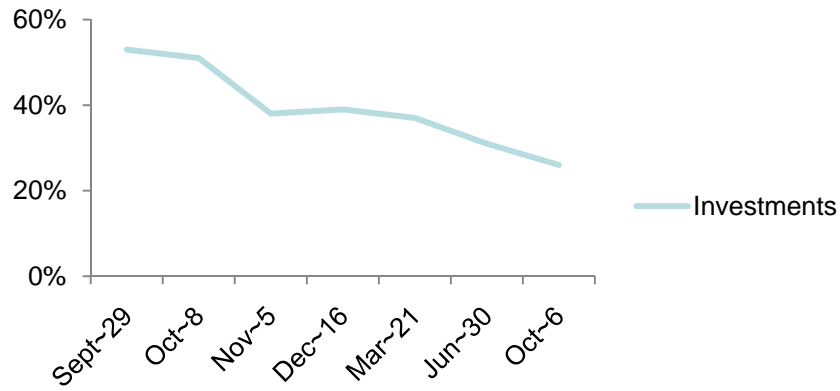


Very High Stress

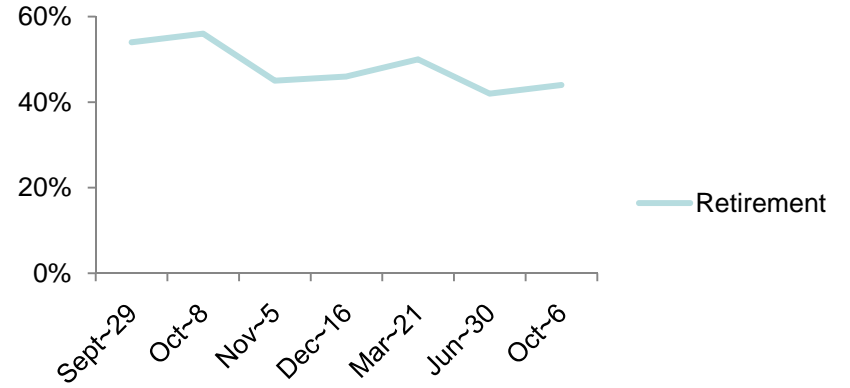




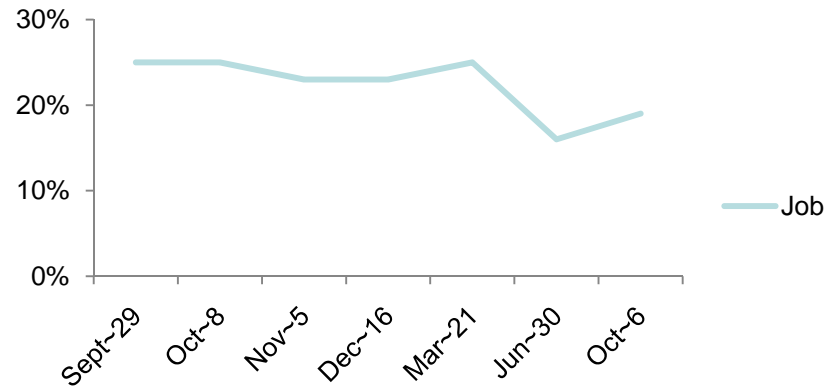
Risk to Investments (High or Very High)



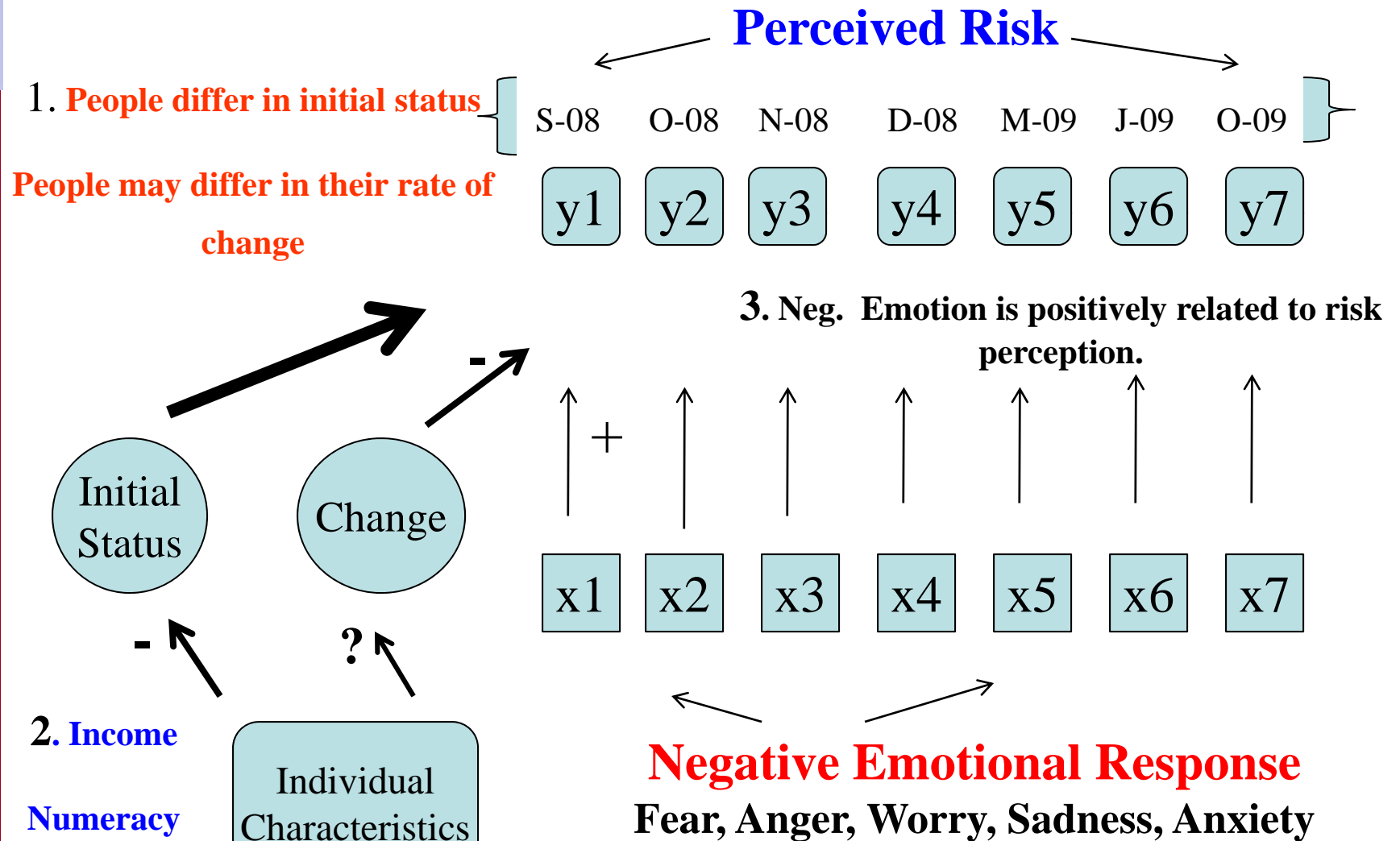
Risk to Retirement (High or Very High)



Risk to Job (High or Very High)



Financial Crisis: Perceived Risk Over Time



The Social Amplification of Risk: Estimating the Effects of Fear and Perceived Risk



GRP = Resource Loss Effects + Behavioral Effects

Casualties
Property Damage
Business Interruption

Stigma
Wage Premiums
Risk Premiums

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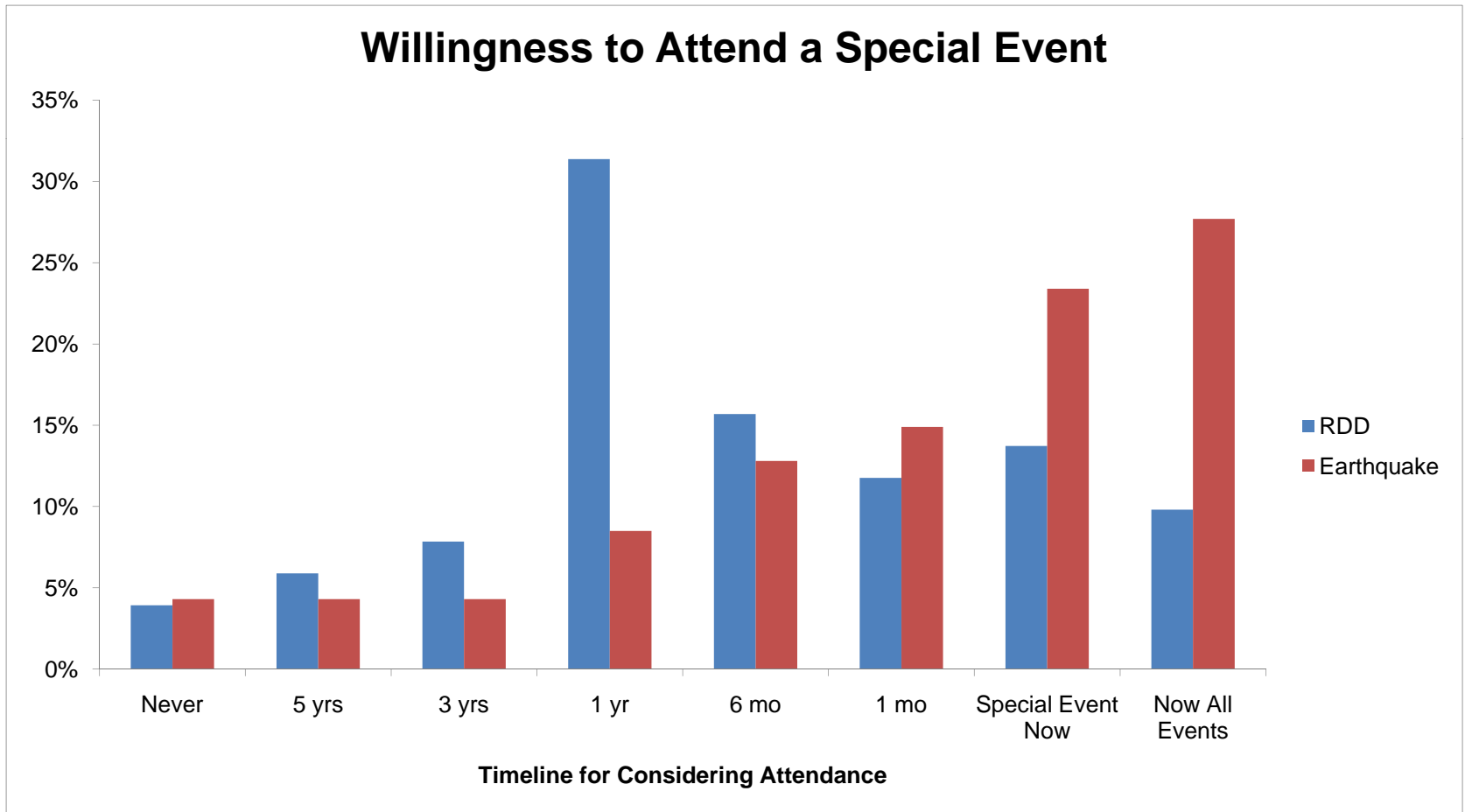


Dirty Bomb Rocks Financial District of Los Angeles!

180 Dead and Hundreds Potentially Exposed to Radiation as
Mayor Requests Downtown to Seek Shelter for Hours

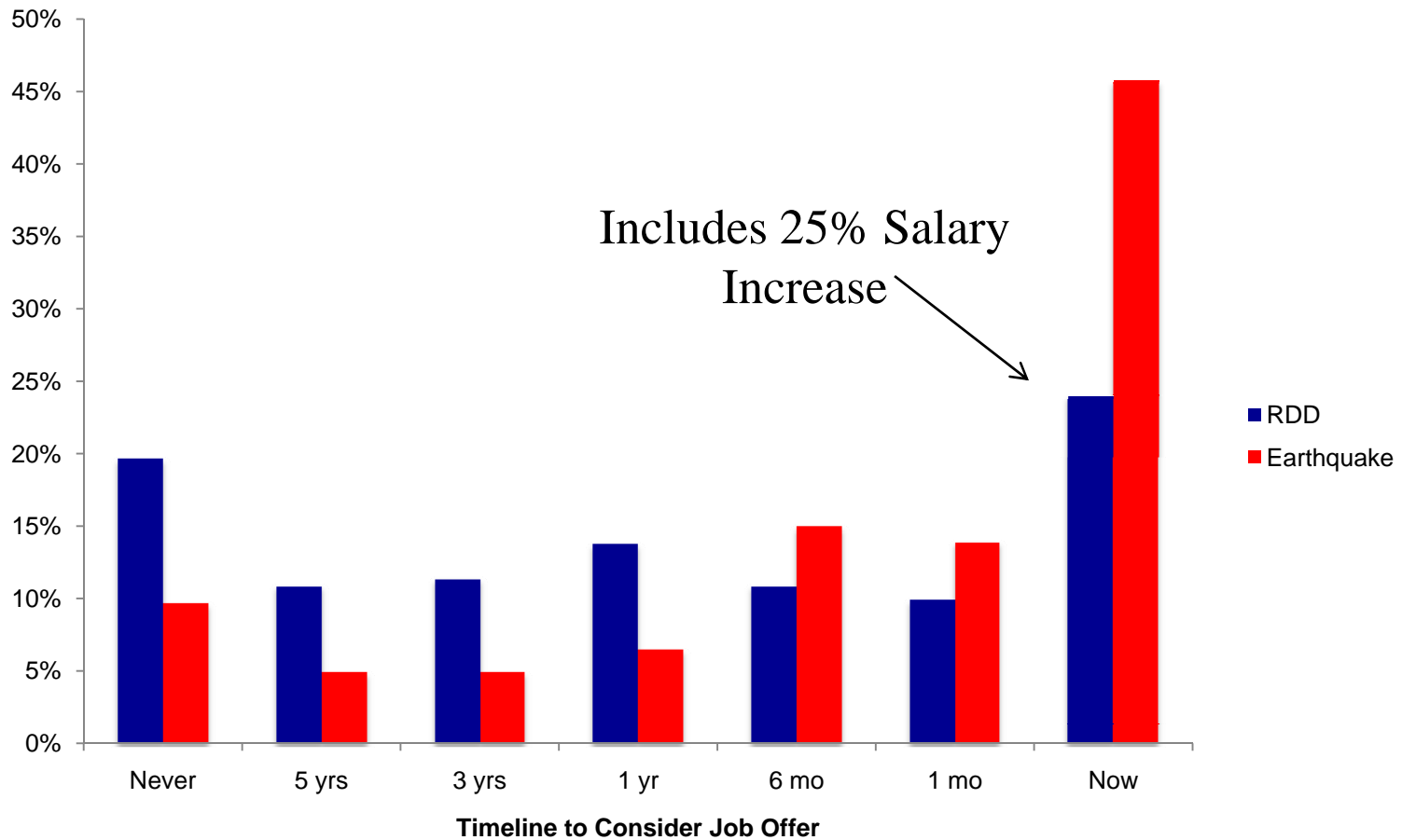
Special Events: Dirty Bomb vs. Earthquake

Willingness to Attend a Special Event



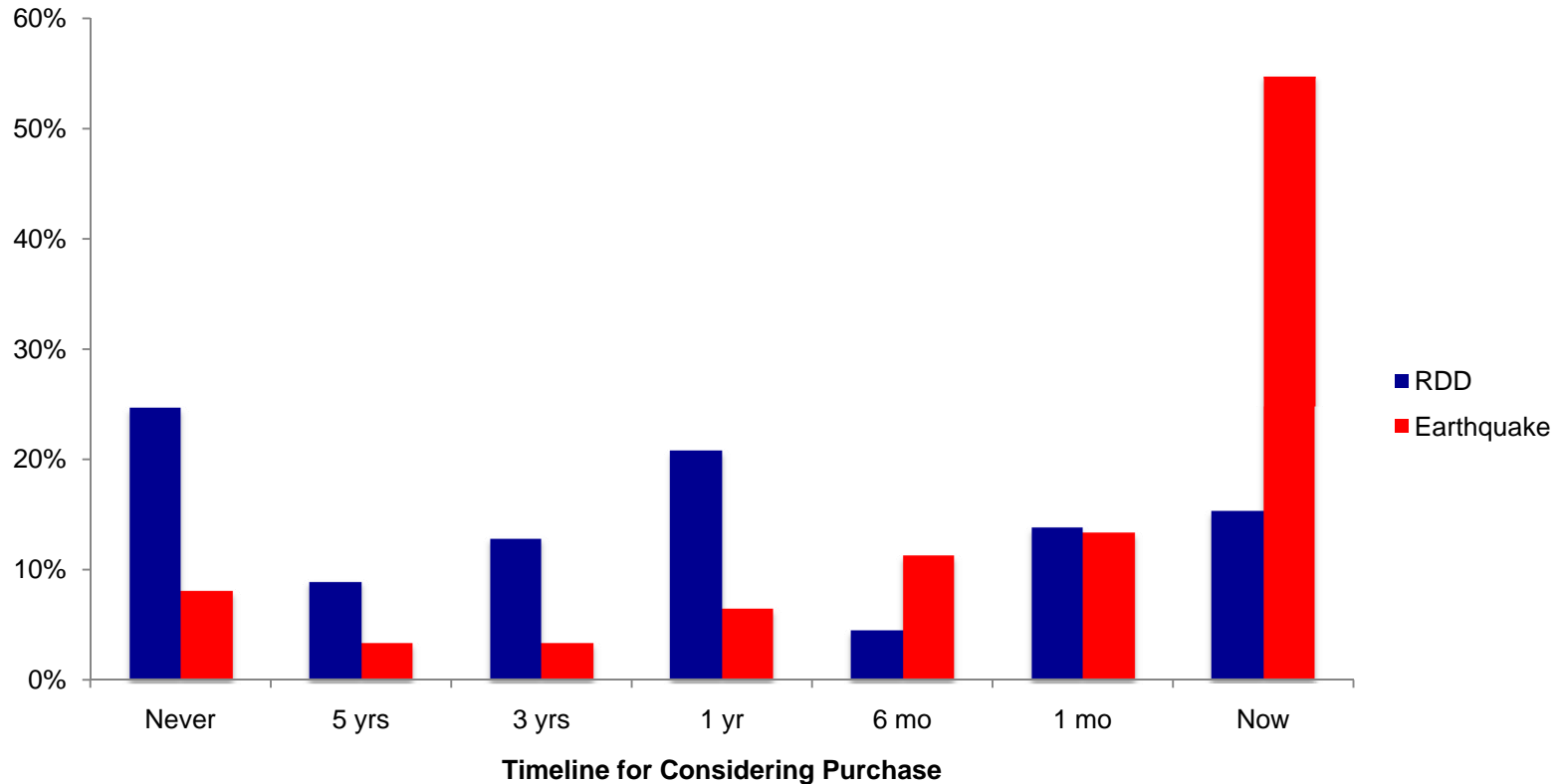
Job Offers: Dirty Bomb vs. Earthquake

Willingness to Accept Job Offer



Specialty Products: Dirty Bomb vs. Earthquake

Willingness to Purchase Specialty Chocolate



Resource Loss and Behavioral Effects

- **Resource Loss Effects:**

- **Business Interruption** : 30 Days
- **Fatalities** 180 **Serious Injuries** 270
- **Property Damage** \$0

Behavioral Effects:

Employee risk perceptions (0.25% risk premium in affected area)

Investor risk perceptions (20% rate of return premium)

Consumer/tourist risk perceptions (25% price discount (subset of goods))

Short-Run Impacts

Table 1. Short-Run Impacts of an RDD Attack on LA

Macro-Variable	Resource Loss Effects			Behavioral Effects			
	Business Interruption	Deaths/ Injuries	Capital Damage	Wage Premium	Rate of Return	Commodity Discount	Total
Real GRP (\$M)	-\$1,870	-\$27	0	-\$7	-\$22	-\$6	-\$1,932
Real GRP (%)	-.37	-.005	0	-.001	-.004	-.001	-.38
Employment (%)	-.15	-.003	0	-.002	-.006	-.002	-.16
Investment (%)	-.20	-.005	0	-.001	-.005	-.222	-.43
GRP Deflator (%)	.02	.002	0	-.001	-.022	-.010	-.01
Terms of Trade (%)	.08	.002	0	.001	-.009	-.006	.06

Long-Run Impacts (Typical Year)

Table 2. Long-Run Impacts of an RDD Attack on LA

Macro Variable	Wage Premium	Rate of Return Premium	Commodity Discount	Total
Real GRP (\$M)	-\$41	-\$2,941	-\$66	-\$3,049
Real GRP (%)	-.008	-.58	-.013	-.60
Employment (%)	-.009	-.47	-.013	-.50
Investment (%)	-.007	-.73	-.012	-.75
GRP Deflator (%)	.004	.19	-.003	.19
Terms of Trade (%)	.003	.17	-.002	.17

Long-Run Impacts Across Sectors

Table 3. Long-Run Sectoral Impacts of an RDD Attack (% change in GRP)

Regional Industry	Wage Premium	Premium Rates of Return	Commodity Discount	Total
Utilities	-0.01	-0.57	-0.01	-0.59
Manufacturing	-0.01	-0.29	.00	-0.30
Trade	-0.01	-0.41	-0.01	-0.43
Information	-0.01	-0.21	.00	-0.21
Finance, Insurance	-0.01	-1.13	-0.01	-1.14
Business services	-0.01	-0.77	-0.01	-0.79
Arts	-0.01	-0.41	-0.06	-0.48
Public administration	-0.01	-0.48	-0.02	-0.51

Risk Perception Multipliers

Table 4. Decomposition of Results

Impact	Category	GRP
S-R	Direct BI	-\$1,400
S-R	Indirect BI	-\$470
S-R	Other Resource Loss	-\$27
S-R	Behavioral	-\$35
S-R	Sub-Total	-\$1,932
L-R	One-Year Behavioral	-\$3,049
L-R	Seven-Year Behavioral	-\$10,672
Ratio	S-R Total BI/S-R Direct BI	1.34
Ratio	S-R Total/S-R Direct BI	1.38
Ratio	L-R One-Year/S-R Direct BI	2.18
Ratio	L-R Seven-Year/S-R Direct BI	7.62
Ratio	Behavioral (Seven-Year)/Ordinary Loss	5.71