

# Quantitative Analysis of Relative Precaution

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# Outline

Motivation

Data

- Selection of risks
- Scoring

Results

- Relative precaution
- Trends

# Motivation

## Case studies are limited

- *Deep but narrow*
- Small sample
- May be selected to support a conclusion

## Quantitative analysis is complementary

- *Broad but shallow*
- Larger sample
- Random sample permits generalization

# Definition and Selection of Cases

Unit of analysis – "a risk that may be regulated"

- No comprehensive list

## Risk matrix

- Constructed by pooling 403 lists from 252 sources (articles and reports)
- Condensed ~11,000 "verbatim" risks to 2,878 "unique" risks
- Classified unique risks by
  - Type (18 categories)
  - Endpoint (ecological, health, safety)

Simple random sample of 100 risks

Distribution by Category (percent)

Code	Category	Matrix	Sample
1	Crime and Violence	1.8	3
2	Alcohol, Tobacco, and Other Drug	3.0	3
3	Medications and Medical Treatment	6.8	8
4	Transportation	8.2	13
5	Accident Risks Not Elsewhere Classified	2.4	2
6	Recreation	5.5	8
7	War, Security, and Terrorism	1.5	3
8	Toxic Substance	9.8	8
9	Food and Agriculture	9.5	9
10	Pollution	7.5	8
11	Energy Production	5.0	3
12	Political, Social, and Financial	3.4	1
13	Ecogeological	4.0	2
14	Global	2.2	1
15	Human Disease/Health	9.7	9
16	Occupational	15.0	17
17	Consumer Product	3.4	2
18	Construction	1.4	0

Total

2,878

100

Distribution by Endpoint (percent)		
E, H, S Code	Matrix	Sample
0 None	2.2	2
1.1 Ecological	2.7	4
1.2 Health	17.7	14
1.3 Safety	15.3	19
Total - One	35.6	37
2.1 Ecological and health	4.2	4
2.2 Ecological and safety	3.6	4
2.3 Health and safety	17.2	26
Total - Two	25	34
3 Ecological, health, and safety	37.2	27
Total - All	100	100
Total - All Ecological (1.1, 2.1, 2.2, 3)	47.7	39
Total - All Health (1.2, 2.1, 2.3, 3)	76.3	71
Total - All Safety (1.3, 2.2, 2.3, 3)	73.2	76

# Scoring of Relative Precaution

Collected information on regulations

- Federal and state levels
- Evaluated most stringent regulations

Scored relative stringency of regulations for each risk, each of 35 years (1970-2004)

Relative precaution

Europe: +1, Tie: 0, US: -1

Confidence level: 0 – 3

Weighted score = product

Relative Precaution, 1970 – 2004 (t-statistic)

Category	Number	Unweighted	Weighted	
<b>GREATER US PRECAUTION</b>				
5 types 30 risks	Alcohol, Tobacco, and Other Drug	3	-1.5	-5.0**
	Accident Risks Not Elsewhere Classified	2	-0.8	-1.2
	Pollution	8	-1.0	-2.4**
	Recreation	8	-0.8	-1.8*
	Food and Agriculture	9	-0.4	0.4
<b>TIE</b>				
3 types 6 risks	Crime and Violence	3	0.0	1.0
	Political, Social, and Financial	1	0.0	0.0
	Consumer Product	2	0.0	0.0
<b>GREATER EUROPEAN PRECAUTION</b>				
10 types 64 risks	Human Disease/Health	9	0.0	0.8
	Energy Production	3	0.0	0.1
	Transportation	13	0.3	2.8**
	Medications and Medical Treatment	8	0.2	-0.1
	Occupational	17	0.6	2.0**
	Toxic Substance	8	0.5	2.3**
	Ecogeological	2	0.8	1.8*
	War, Security, and Terrorism	3	1.1	3.7**
	Global	1	1.1	2.7**
	Construction	0	NA	NA
Total	100	-0.1	1.9*	

Figure 1. Trends in Relative Precaution  
(all risks)

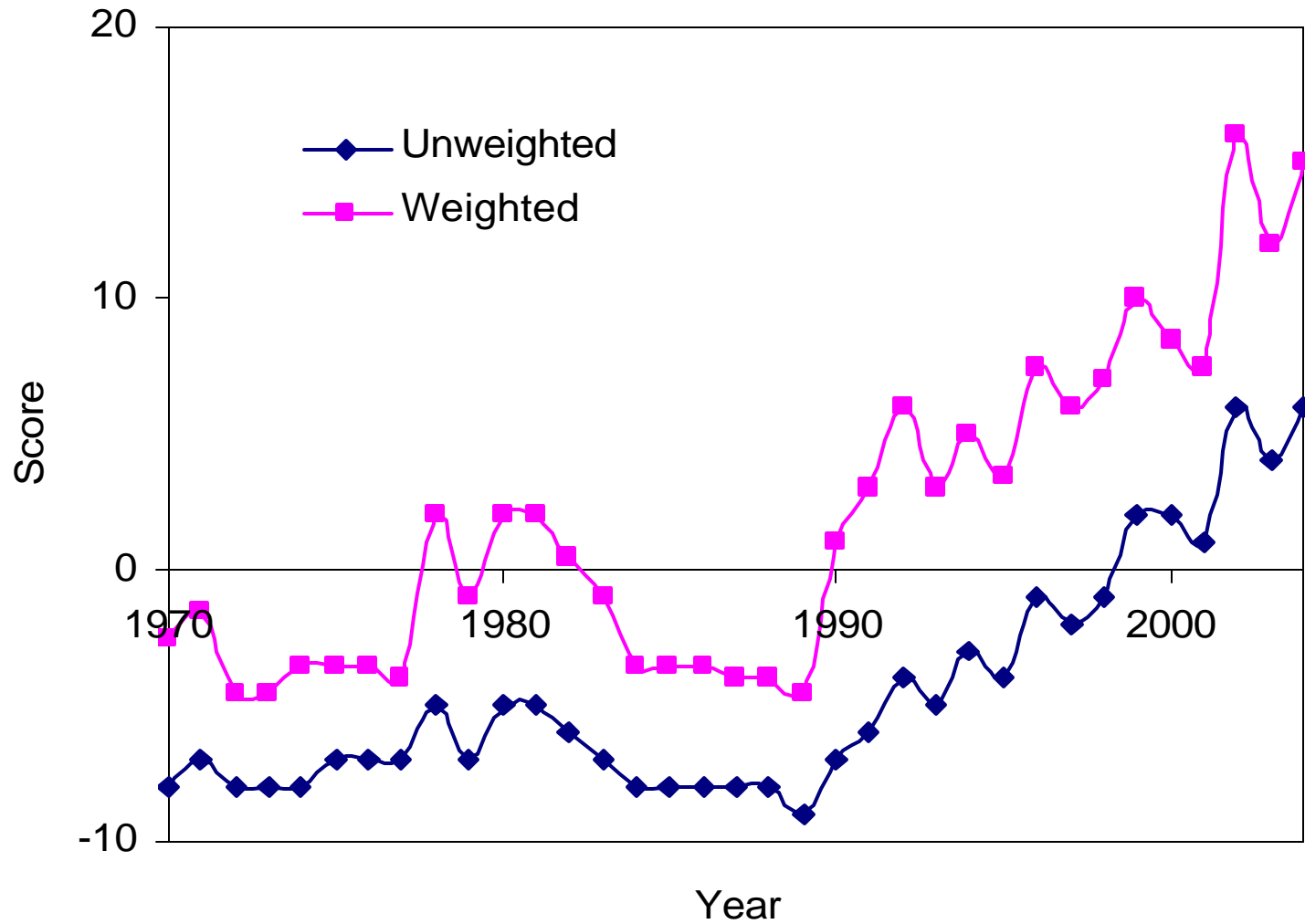


Figure 2. Trends by Endpoint Category  
(unweighted scores)

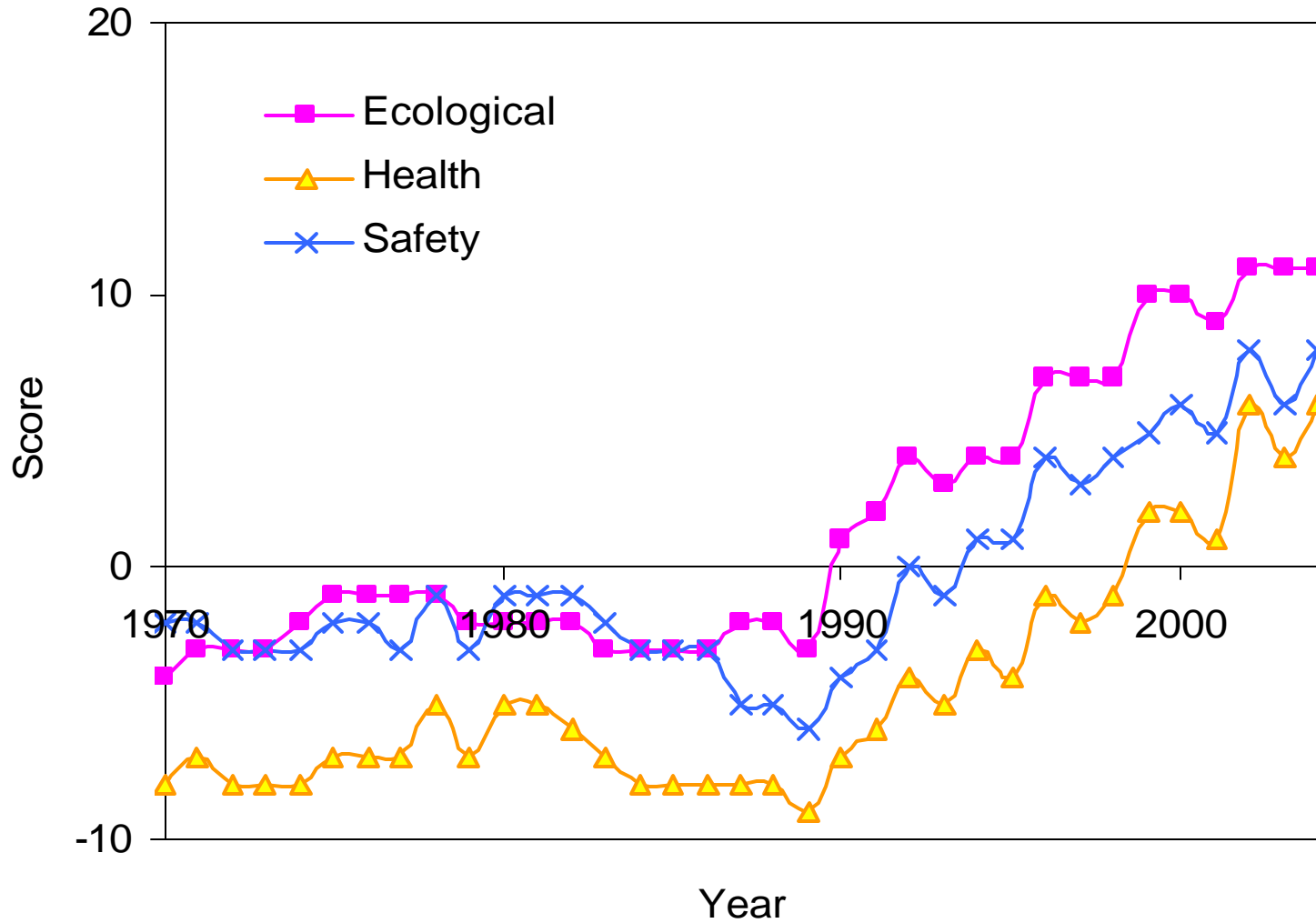
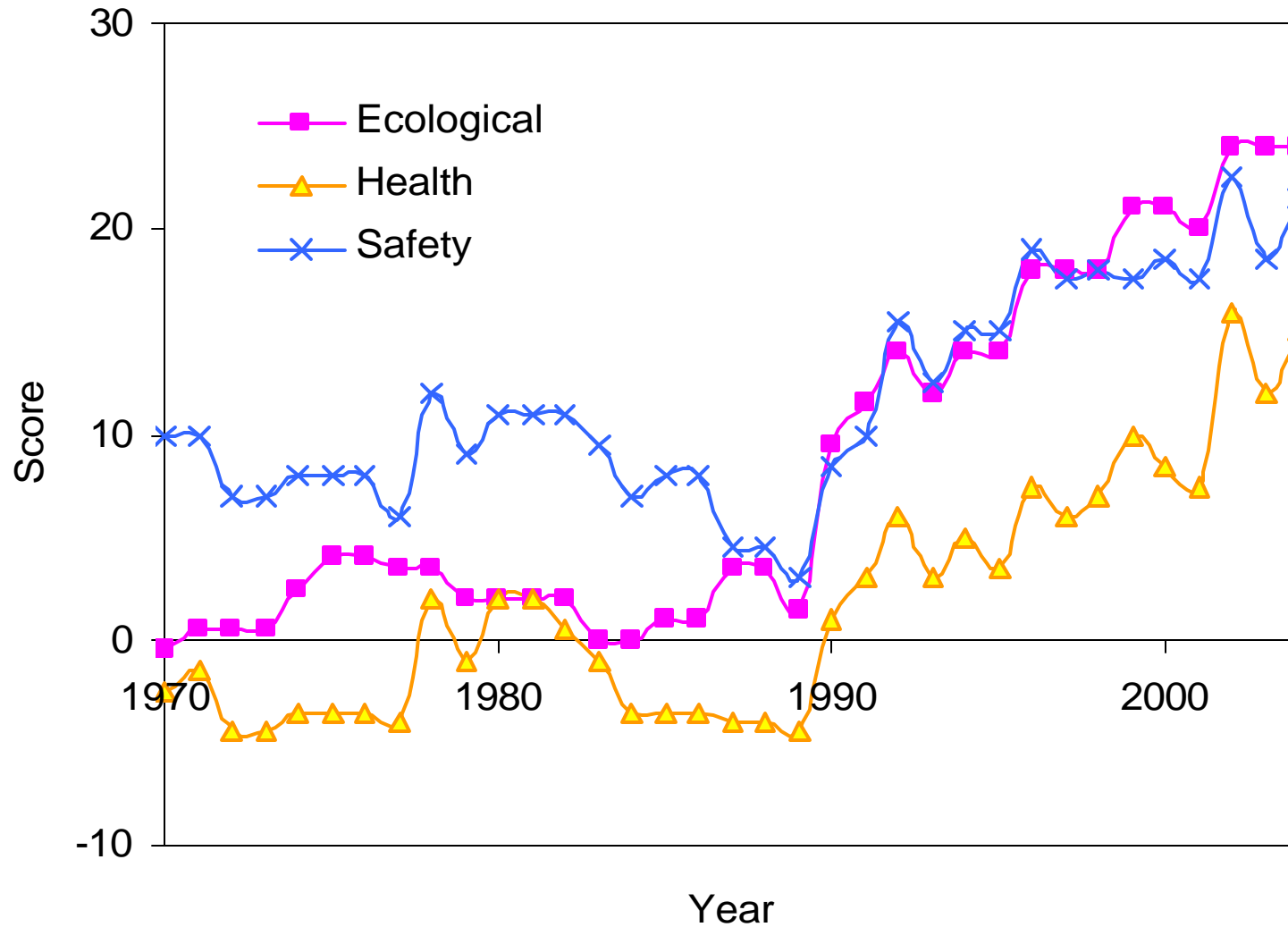
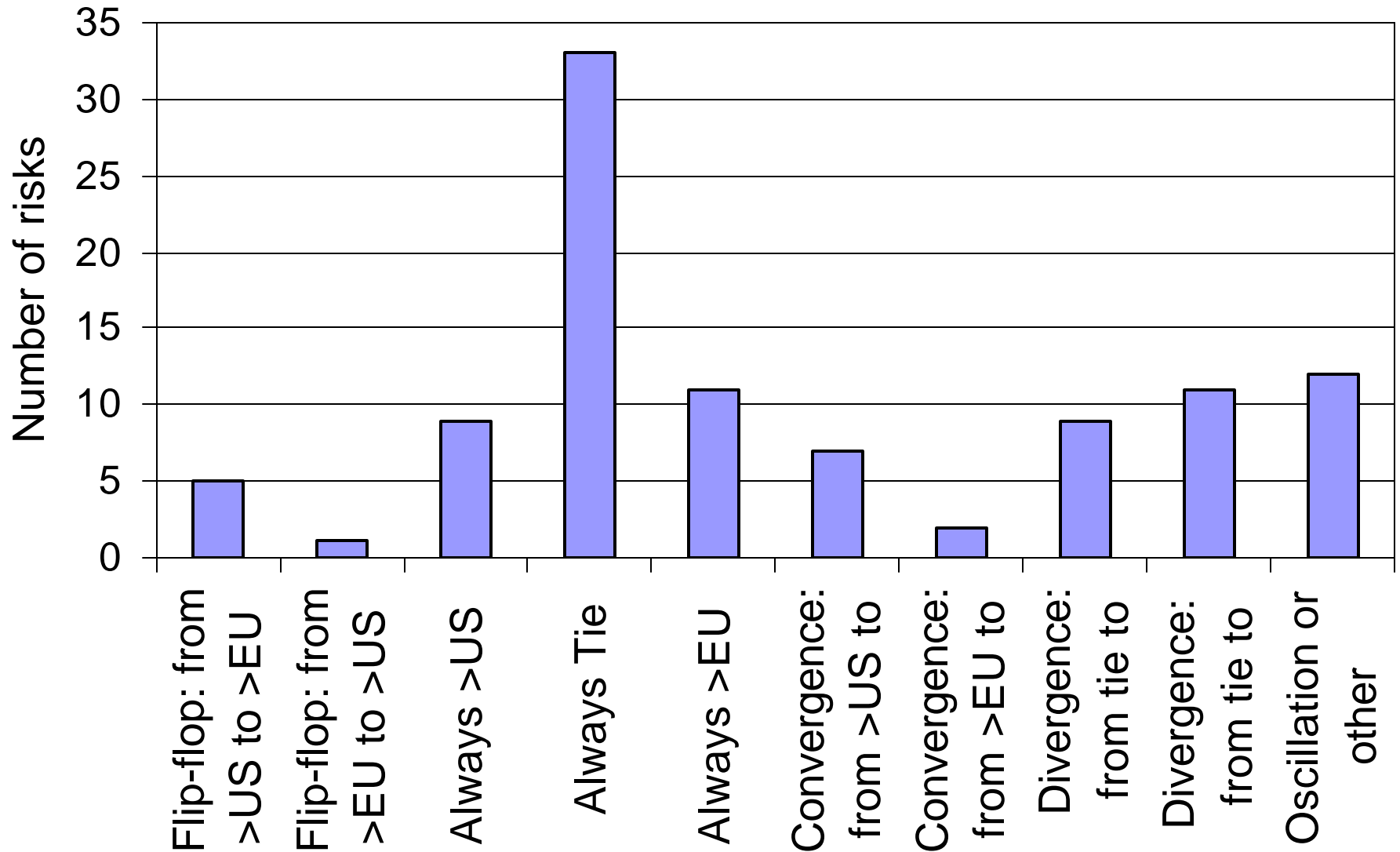


Figure 3. Trends by Endpoint Category  
(weighted scores)



# Figure 4. Patterns of Relative Precaution



# Summary

## Trends consistent with "flip-flop"

- No trend 1970 – 1989
- Shift toward relatively more precaution in EU 1990 – 2004

## Diversity across risks

- Shift toward greater EU precaution: 21 risks
- Shift toward greater US precaution: 14 risks
- EU always more precautionary: 11 risks
- US always more precautionary: 9 risks