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## Multicriteria Decision Analysis for banks risks evaluation

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# ICDSST 2015

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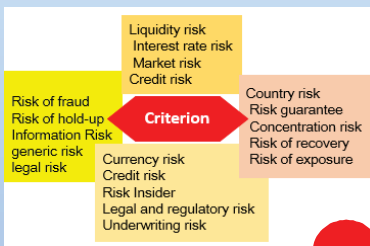
## Multicriteria Decision Analysis for Banks Risks Evaluation

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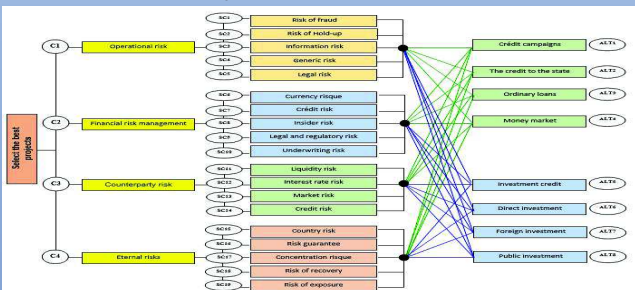
### Methods



The decision process required to the AHP method is presented in 12 steps, first the problem or the objective of the analysis must be clearly identified as the figures above: the objective select best projects (1) criteria (2), sub-criteria (3) and alternative (4)

The steps after identifying the problems are as follows:

#### 1. Establish the hierarchy structure



#### 2. Make the pairwise comparisons (binary) criteria in relation to the objective

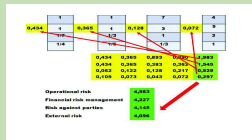
Pairwise comparison criteria	Considered important criteria	Scale	Evaluation
Operational risk / Financial risk management	Financial risk management	also important	1
Operational risk / risk against parties	Operational risk	Very highly important	7
Operational risk / External risks	Operational risk	intermediate value	4
Financial risk management / risk against parties	Financial risk management	Slightly higher	3
Risk against parties / External risks	Risk against parties	Slightly higher	3
Financial risk management / external risk	Financial risk management	highly significant	5

Pairwise comparison criteria	Operational risk	Financial risk management	Risk against parties	External risk
Operational risk	1	1	7	4
Financial risk management		1	3	5
Risk against parties	1/7	1/3	1	3
External risk	1/4	1/5	1/3	1

#### 3. Calculate the priorities vectors

1	1	7	4	
1	1	3	5	0,418
1/7	1/3	1	3	0,385
1/4	1/5	1/3	1	0,265
2,38	2,53	11,33	13,00	0,128
				0,072

#### 4-5-6-7. Determine the mean of the priority value ( $\lambda_{max}$ ), IA, IC, RC



The results can be used to determine the  $\lambda_{max}$  average the index and the ratio of coherence. The average value calculation and found is earlier

$$\lambda_{max} = \frac{\sum_{j=1}^n a_{ij} w_j}{n \sum_{j=1}^n w_j} = \frac{4,563 + 4,227 + 4,145 + 4,096}{4} = 4,258$$

We calculate the coherence index (CI) for  $n = 4$

$$CI = \frac{\lambda_{max} - n}{n - 1} = 0,086$$

It reads the value of the Index Random (IA) in the table of coherence index for  $n = 4$  then IA = 0,90

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
IA	0	0	0,058	0,086	0,112	0,135	0,157	0,178	0,196	0,213	0,228	0,241	0,252	0,261	0,269

We calculate the ratio consistency RC

$$RC = \frac{CI}{IA} = \frac{0,086}{0,90} = 0,0955 \approx 9,55\%$$

RC = 9,55% < 10% the degree of consistency of comparison is acceptable

8-9.10. Perform comprehensive comparisons against each existing criterion and the determination of the relative value of each sub consideration of and near the upper level, with the project aggregation

Operational risk	Financial risk management	Counterparty risk	External risk
C1 [0,434]	C2 [0,366]	C3 [0,128]	C4 [0,072]
SC1 [0,1264]	SC6 [0,1944]	SC11 [0,238]	SC15 [0,489]
SC2 [0,606]	SC7 [0,447]	SC12 [0,514]	SC16 [0,202]
SC3 [0,141]	SC8 [0,089]	SC13 [0,133]	SC17 [0,155]
SC4 [0,0752]	SC9 [0,163]	SC14 [0,115]	SC18 [0,091]
SC5 [0,052]	SC10 [0,137]		SC19 [0,063]

#### 11-12. Calculate alternative priorities and Determine the relative performance criteria and alternatives

### Results

The results of this study show that ALT8 > ALT2 > ALT1  
ALT8 : public investment is the best choice among the alternatives.

The results for each risk event depend on choice of pairwise comparison of decision maker, the AHP method is an effective tool for decision makers in the field of financial institutions.

The processing procedure of evaluation criteria proposed in this study provide policy makers with ideas recommendations for the future.

The multi-criteria analysis method is in itself an additional structured approach to deal with all relevant problematic in an organized manner.

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