



From 1973 through 2010, the Standard and Poor 500 Index had an average annual gain of 11.5%. During this time, its greatest annual gain was 37.4% in 1995, and its greatest annual loss was 37% in 2008.

EXAMPLE 6 Comparing Two Expected Values

A *speculative investment* is one in which there is a high risk of loss. What is the expected value for each of the following for a \$1000 investment?

a. Speculative investment

- Complete loss: 40% chance
- No gain or loss: 15% chance
- 100% gain: 15% chance
- 400% gain: 15% chance
- 900% gain: 15% chance

b. Conservative investment

- Complete loss: 1% chance
- No gain or loss: 35% chance
- 10% gain: 59% chance
- 20% gain: 5% chance

SOLUTION

a. Speculative investment

	A	B	C	D
1	Result	Payoff	Probability	Expected Value
2	Complete loss	-\$1,000	40%	-\$400
3	No gain or loss	\$0	15%	\$0
4	100% gain	\$1,000	15%	\$150
5	400% gain	\$4,000	15%	\$600
6	900% gain	\$9,000	15%	\$1,350
7	Total		100%	\$1,700
8				

b. Conservative investment

	A	B	C	D
1	Result	Payoff	Probability	Expected Value
2	Complete loss	-\$1,000	1%	-\$10
3	No gain or loss	\$0	35%	\$0
4	10% gain	\$100	59%	\$59
5	20% gain	\$200	5%	\$10
6	Total		100%	\$59
7				

This example points out the potential gain and the risk of investment. The speculative investment has an expected value of \$1700, which is a high return on investment. If you had the opportunity to make 100 such investments, you would have a high likelihood of making a profit. But, when making only 1 such investment, you have a 40% chance of losing everything.

✓ Checkpoint

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Which of the following investments is better? Explain your reasoning.

c. Speculative investment

- Complete loss: 20% chance
- No gain or loss: 35% chance
- 100% gain: 35% chance
- 400% gain: 5% chance
- 2000% gain: 5% chance

d. Conservative investment

- Complete loss: 2% chance
- No gain or loss: 38% chance
- 20% gain: 55% chance
- 30% gain: 5% chance