Risk and Expected Return

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Outline

- Risk-return tradeoff
- Expected utility
- (E(Rp), σp) diagram
- Indifference curve

Risk-Return Tradeoff

- Suppose you could only pick one of the following return patterns:

```
<table>
<thead>
<tr>
<th>Mean</th>
<th>Stddev</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.15</td>
<td>0.10</td>
</tr>
<tr>
<td>0.35</td>
<td>0.10</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
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</tr>
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<tbody>
<tr>
<td>0.20</td>
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</tr>
<tr>
<td>0.40</td>
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</tr>
</tbody>
</table>

Recall two of the Finance Axioms:

- Investors prefer more to less
- Investors are risk-averse

This means that:

- Investors prefer an investment with a higher expected return $E(R_i)$
- Investors prefer an investment with a lower variance and standard deviation, $\sigma_i$

Investors must optimally trade off risk and return in order to maximize their expected utility.
Indifference Curves

Indifference curve: A set of \((E(R),\sigma)\) combinations that give an investor the same expected utility.