Universidad del Desarrollo
Universidad de Excelencia

Finance I
Fall 2012

Session 4:
Risk, Return and
Opportunity Cost of Capital

Agenda

1. **Recap**

2. **Risk and Return**

3. **Closing**

Are you paying attention?

✔ 1. Yes
2. No

10
Countdown

Fastest users

1. Recap

▶ **A peso today is worth more than a peso tomorrow**

▶ **A "safe" (risk free) peso is worth more than a risky peso**

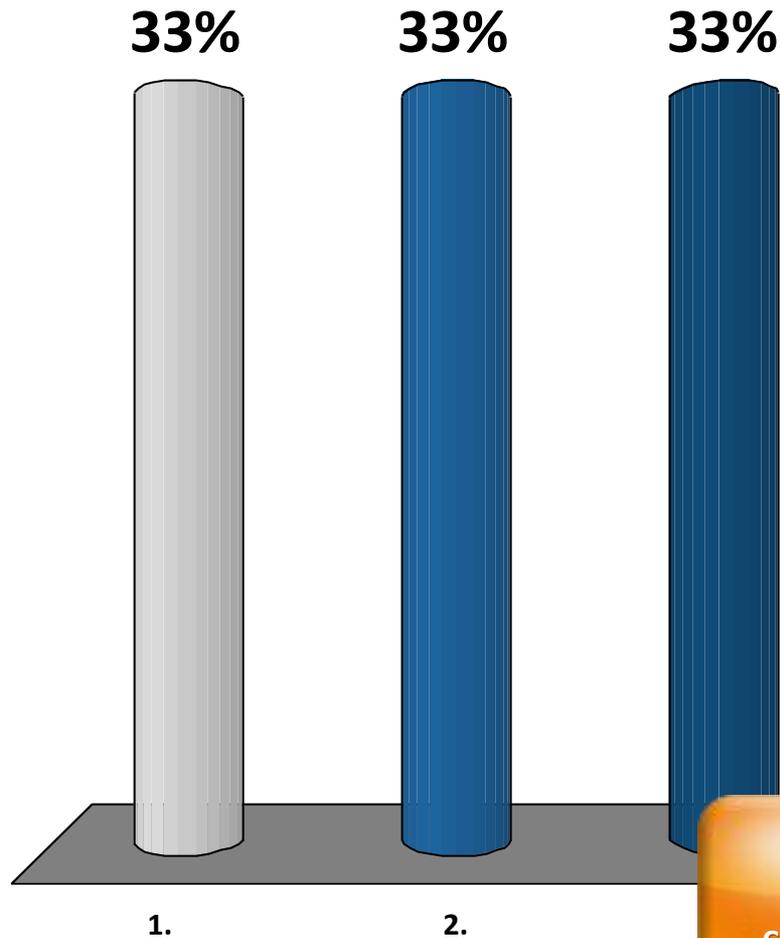▶ **Investment decisions are not affected by owners preferences**

Agenda

1. Recap

2. Risk and Return

3. Closing

Which portfolio of assets has had a higher cumulative return, from 1900 to 2010?

1. **U.S. Treasury Bills**
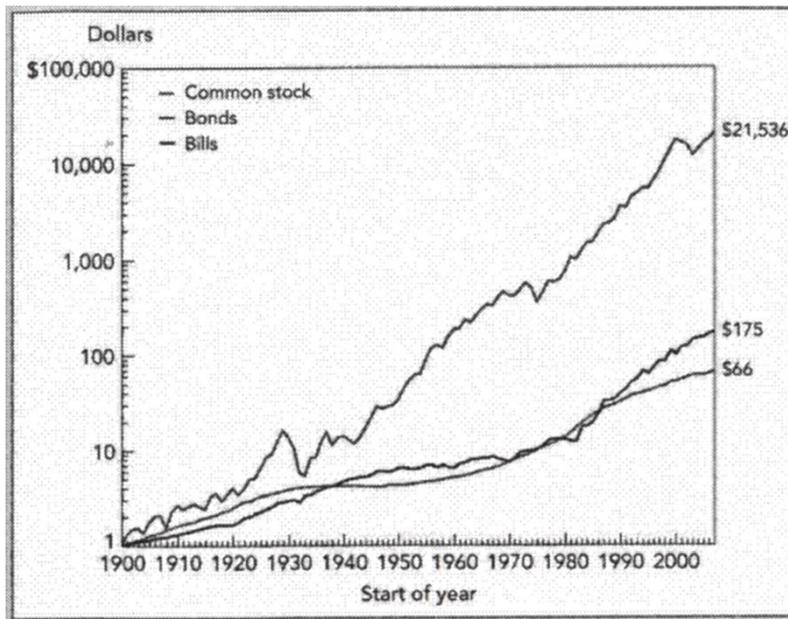2. **U.S. Government Bonds**
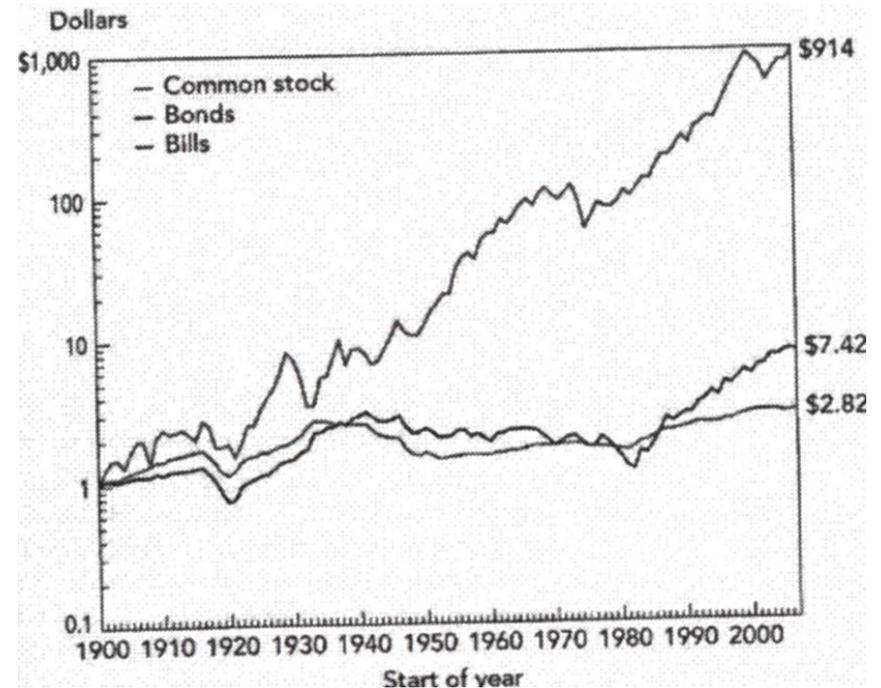3. **U.S. Common Stocks**

33%   **33%**   **33%**

1.   2.

30
Countdown

Historic U.S. asset returns

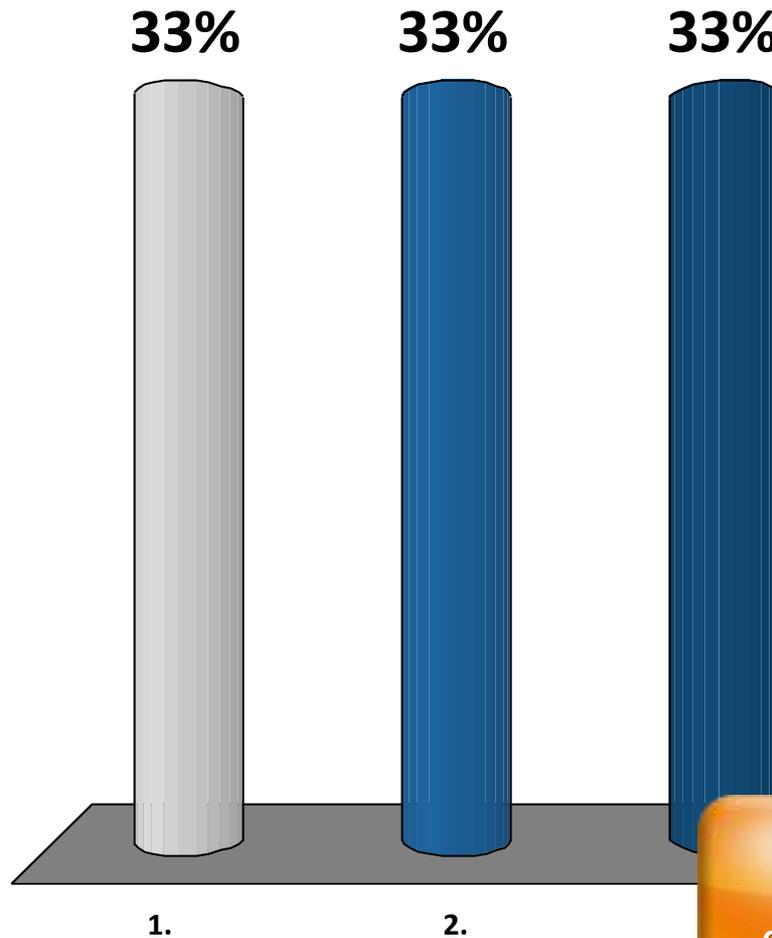**Cumulative returns (nominal)**

Cumulative returns (real)

Does this mean that a portfolio of U.S. Common stock has a higher return than U.S. Treasury Bills?

1. Yes
2. No
3. Unsure

33%   **33%**   **33%**

1.   2.

20
Countdown

2. Risk and Return

▶ **Considering a long time series, T Bills (which are our "risk free" asset) have yielded close to 4.0% (1.1% in real terms), below Government Bonds with 5.2% (2.4% real) and Common stock with 11.7% (8.5% real)**

▶ **If we considerer short time series, this is NOT the case (1929, 1972, 1999- 2001, etc)**

▶ **Please remember: Higher risk does NOT mean higher return**

▶ **The correct concept is: In order to take higher risk, you REQUIRE AN EXPECTED higher return**

- It's a priori (previous to) evaluation and requisite of future results

- It's uncertain (it's risky… with more than 1 possible outcome)

2. How do we measure risk?

▶ **In the simplest terms:**

▶ **Number of different states of nature (different outcomes)**

▶ **Magnitude of that difference (how different)**

Which asset has the lowest risk?

1. 50% $100 and 50% -$100
✓ 2. 50% -$50 and 50% -$100
3. 50% -$50 and 50% $50
4. 33% $100; 34% $0 and 33% -$100
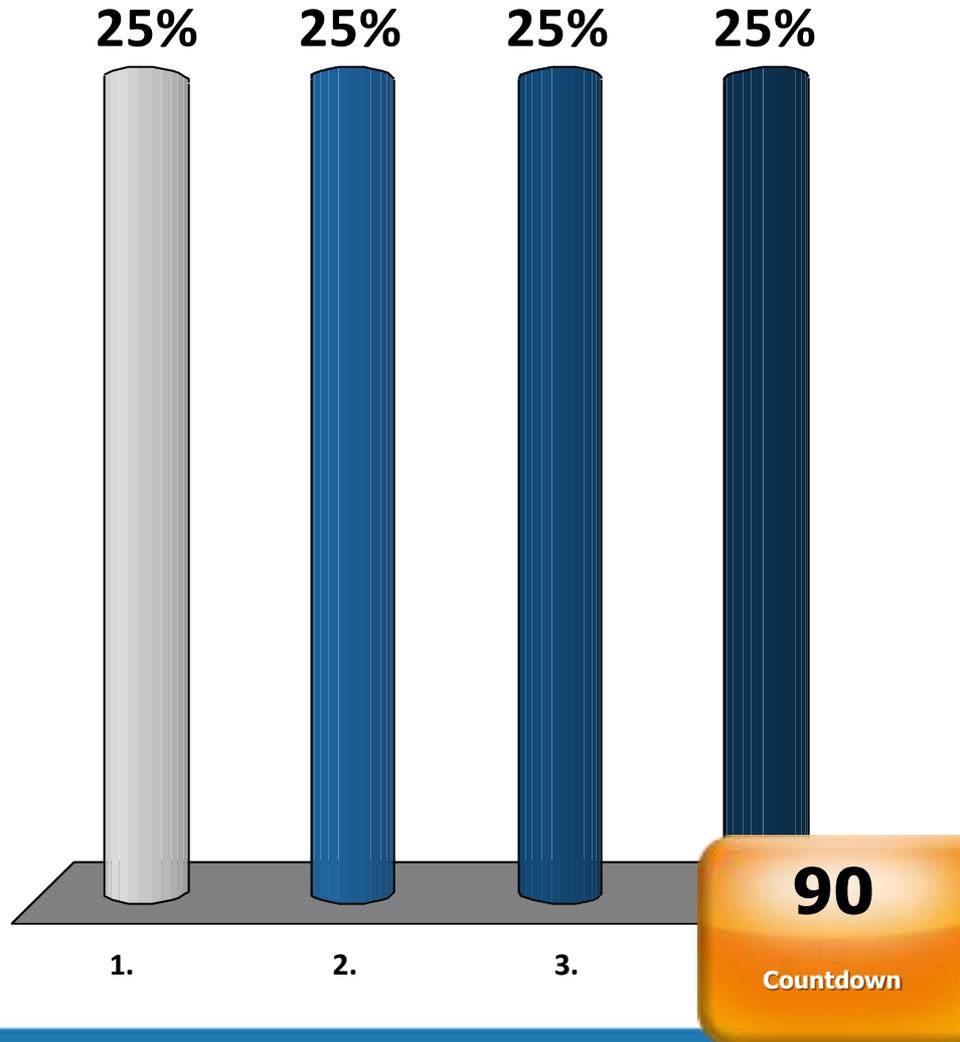
25%   25%   25%   25%

1.   2.   3.

90
Countdown

2. How do we measure risk?

▶ **In the simplest terms:**

▶ **Number of different states of nature (different outcomes)**

- Option 1, 2 and 3 have fewer different outcomes

▶ **Magnitude of that difference (how different)**

- Option 2 has the least different outcomes

▶ **Caution: This is an extreme simplification… not the official rule to measure risk, just a simple explanation for you to REMEMBER**

2. How do we measure risk?

▶ **Although is NOT the ONLY measure of risk, it is the most common**

▶ **We usually measure risk by the standard deviation of expected result of an asset**

▶ **Please recall the following concepts:**

- Expected value

- Variance

- Standard deviation

2. Example for option 1

Option 1					
Return		Probability	Deviation from expected return	Squared Deviation	Prob of squared deviation
	100	50%	100	10,000	5,000
	-100	50%	-100	10,000	5,000

Expected return	0
Variance	10,000
Desv. Est	100

In teams: which asset is riskier?

✔ 1. 50% $100 and 50% -$100
2. 50% -$50 and 50% -$100
3. 50% -$50 and 50% $50
4. 33% $100; 34% $0 and 33% -$100

2. Risk and Return

▶ **We know that under certain assumptions:**

- A peso today is worth more than a peso tomorrow

- A safe peso is worth more than a risky peso

▶ **Therefore, the opportunity cost of capital is the highest available return for assets of the same risk**

- For safe assets, the opportunity cost of capital is the time value of money

▶ **If we can determine the level of risk of an asset, we can determine the opportunity cost of capital by comparison**

- Comparing with the **REQUIRED** rate of return of assets with the same risk

Where can we find the rate of return for risky assets

1. Newspaper
2. Stock broker
3. Analyst reports
4. All of the above
✔ 5. None of the above

20%   20%   20%   20%   20%

1.   2.   3.   4.
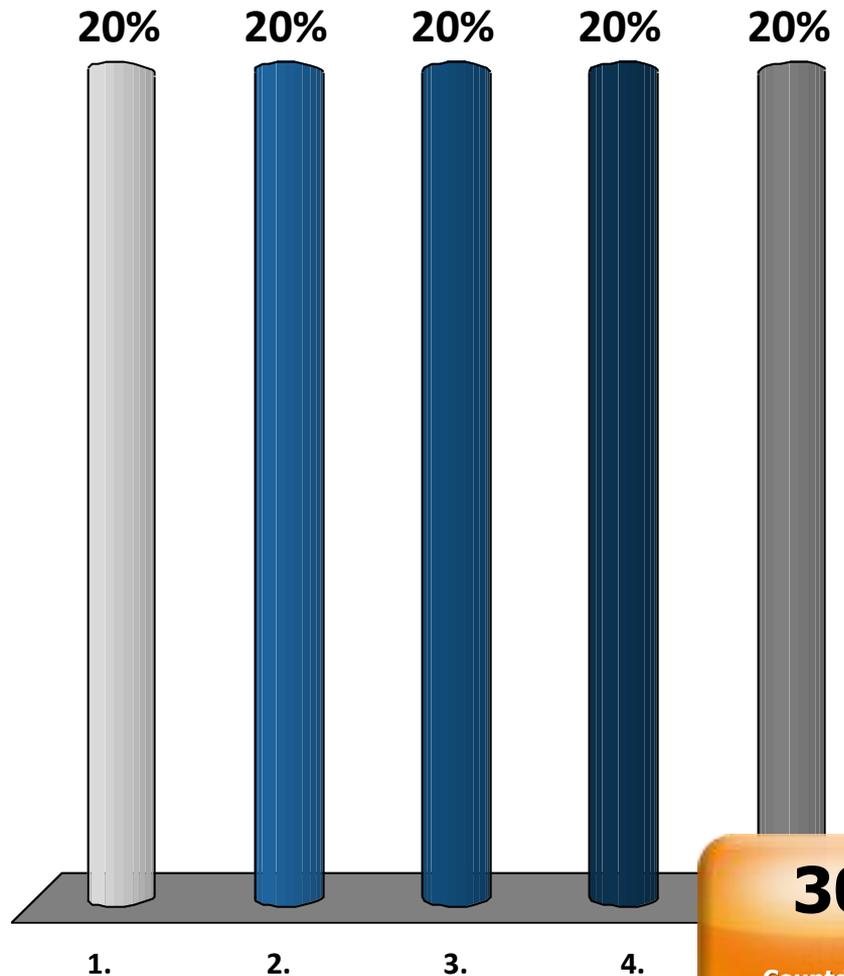
0 of 5

30

Countdown

2. Risk and Return

▶ **We can't find it anywhere!!!**

▶ **It's uncertain!!!**

▶ **Even for risk free assets!!!**

▶ **We can guess…**

- (estimate to sound a bit more polite)

▶ **… using past information**

2. Risk and Return

▶ **Adding a few more assumptions:**

- The effective return is equal to the required return of investors

- The current required return is equal to the past required return

▶ **Then, we can use the achieved past returns as estimations of past required return and assume that it will remain the same in the future**

▶ **To determine the opportunity cost of capital we compare the historic return of assets with the same risk and assume that's equal to the historic required return and it will remain the same in the future**

Agenda

1. **Recap**

2. **Risk and Return**

3. **Closing**

Have you registered in the class?

1. Yes
2. No

0%   0%

1.   2.

3. Recap

▶ **Short term returns vary a lot, long term returns not so much, so to compare you should use _____ term returns**

▶ **Risk can be measured by:**

▶ **To determine the opportunity cost of capital you should compare with the required return of assets with _____ level of risk**

▶ **In order to use historic returns as estimates of required rates of return you must accept the following assumptions:**

3. Closing

▶ **Study chapter 8 BMA**

▶ **Next TA session will be schedulled shortly.**

▶ **We won't have classes nor TA session next Wednesday**

▶ **You will receive the following link in your email**

https://docs.google.com/spreadsheet/viewform?formkey=dEw1enc0T2pKaXZPVlB6X1IvT
mZjU2c6MQ

▶ **You must answer BEFORE Wednesday 21st at 16:00**

Puntuaciones de participantes

45	Participante 5916EC		
40	Participante 58CA5D		
40	Participante 591715		
40	Participante 58CAB2		
35	Participante 5917FF		