

Example on annualized returns

This is a sequence of daily gross returns for a certain week

```
a = [1.1, 1.05, 0.89, 1.2, 1.03];
```

Q1. What is the weekly (mutiperiod) gross return?

```
mulitp_gross = prod(a)
```

Q2. What is the annualized gross return?

```
ann_gross = prod(a)^(1/5)
ann_gross = mulitp_gross^(1/5)
```

Q3. Is it okay to replace a with [ann_gross,ann_gross,ann_gross,ann_gross,ann_gross]?

```
ann_gross^5
mulitp_gross
```

This means you can replace a with

- [ann_gross,ann_gross,ann_gross,ann_gross,ann_gross] and get the same Weekly gross
- The multiperiod gross return mulitp_gross is equivalent to the single-period (daily return) ann_gross. I.e. havign a net retrun over 5 days of 27.05% is equivalent to having a daily net return of 4.91%

Is this a good investment?

You start with 2000\$ and after 5 years you get 2500\$.

Q1. What is the net return?

```
W0 = 2000; % now
W5 = 2500; % after 5 yeras

W5/W0 -1 % This is a 5 year net return, is it a good investment?
```

Q2 Does 25% look good?

Hard to tell: the fact is that is a 5-years retrun but we commony reason in terms of annual (1-year) retruns!

What is the corresponding 1-year return?

```
(W5/W0)^(1/5) -1
```

Q3. is it good? <https://www.rendimentibtp.it/>

Q4. Would you invest in such security?

A 0.03% daily net return is good?

Solution 1:

Take the BTP year return and compute its daily equivalent

- What is the number that multiplied by itself 252 times gives the gross risk free rate?

```
fprintf('Gross: %.5f', (1+0.0475)^(1/252))  
fprintf('Net: %.5f', (1+0.0475)^(1/252) -1)
```

The BTP gives you 0.018% Daily: 0.03% is certainly good

Solution 2:

Take the 0.03% daily and make it annual

- if you invest at a gross rate of 0.03% every day for one year, what are the year gross/net rates?

```
fprintf('Gross: %.5f', (1+0.03/100)^252)  
fprintf('Net: %.5f', (1+0.03/100)^252-1)
```

The BTP gives you 4.75% yearly: 7.85% is certainly good!