

# Midterm 1 Review

Andrei Jorza

1. Work out some of the missing data in the following table. Every value is annual.

	$i$	$i^{(9)}$	$i^{(\infty)}$	Simple $i$	$d$	$d^{(5)}$	Simple $d$
$i = 5\%$	5%						
$i^{(9)} = 6\%$		6%					
$i^{(\infty)} = 7\%$			7%				
Simple $i = 10\%$				10%			
$d = 8\%$					8%		
$d^{(5)} = 15\%$						15%	
Simple $d = 9\%$							9%

2. Getting 2 at time 2 and 3 at time 3 is financially equivalent to getting 4 at time 1. What is the constant interest rate  $i$ ?
3. An investment goes on for 5 years. In the  $k$ -th year, the nominal interest rate is  $i^{(k)} = (4 + k)\%$ . What is the average annual interest rate over this 5-year period?
4. You are offered two investment opportunities:
- Invest 2 now, 3 at time 2, and 5 at time 5 in an account that grows with force of interest  $\delta_t = \frac{1\%}{1+t}$ .
  - Invest 7 now, 2 at time 3, and 3 at time 5 in an account with constant nominal interest rate  $i^{(12)}$ .
- The two investment opportunities are financially equivalent at the present. What is  $i^{(12)}$ ?
5. Which of the following two annuities results in a larger balance at time 20?
- An annuity due purchased at time 3 with 10 payments of 2 every year, with a yearly interest rate of 10%, or
  - An annuity immediate purchased at time 5 with 5 payments of 3 every two years, with a yearly interest rate of 12%?