

Consider a discrete-time model of a household's budget. Its stock of capital at the end of period 0 (beginning of period 1) is K_0 . During period 1, the household receives wage income W_1 (in real terms) and spends C_1 on consumption goods (again, in terms of goods, not dollars). Each unit of capital that it holds at the beginning of the period bears a net return during period 1 of r_1 (and you may assume there is no depreciation).

1. How much capital K_1 does the household have at the end of period 1 as a function of K_0 , W_1 , C_1 , and r_1 ?
2. Apply the same formula to period 2 (with income and consumption of W_2 and C_2 and a net rate of return of r_2) to calculate K_2 in terms of K_1 , W_2 , C_2 , and r_2 .
3. Substitute your formula for K_1 from question 1 into the formula in question 2 to get an expression for K_2 in terms of the two W terms, the two C terms, the rate of return, and initial capital K_0 . (You may assume that the rate of return is constant, so $r_1 = r_2 = r$.)
4. Suppose that a household is "born" at the beginning of period 1 with no initial wealth ($K_0 = 0$) and "dies" at the end of period 2, leaving no wealth behind ($K_2 = 0$). What is the household's budget constraint linking consumption and wage income in the two periods?
5. If we were to draw this budget constraint in terms of C_1 (on the horizontal axis) and C_2 (on the vertical axis), what would be its slope and vertical intercept?