Leisure-consumption preferences

A consumer who only has wage income, with preferences between leisure-consumption $U = l^2c$. Find the labor supply

Solution

The consumer faces a time constraint that balances leisure and labor supply within the total available time, typically assuming there are 24 hours in a day. If l represents leisure and l_s represents labor supply, then the constraint can be written as:

$$l + l_s = 24$$

This means that the time spent on leisure and the time spent working must add up to the total time available in a day, which is 24 hours.

The consumer also faces a budget constraint that relates consumption, wage rate, and labor supply. If c represents consumption, w the wage rate, and l_s the labor supplied (work hours), the budget constraint is given by:

$$w \cdot l_s = c$$

This equation states that the total income earned from supplying labor (wage times hours worked) is used to finance consumption. If there are no other sources of income or savings, then the total wage income will be equal to total consumption expenditure.

If we are to express the consumer's budget constraint in terms of leisure l, assuming that all income comes from labor and there is no unearned income, the budget constraint incorporating wage rate w, consumption c, and leisure l is given by:

Setting up the equilibrium conditions:

$$|\text{MRS}| = \frac{2c}{l} = \frac{w}{1}$$

And

$$w \cdot (24 - l) = c$$

This reflects that the income available for consumption is equal to the wage rate multiplied by the hours worked, which is the total time available (24 hours) minus the hours spent on leisure.

After clearing consumption in the first equation and substituting in the second, we get the leisure demand function $l = 16$, **from which it follows that the labor supply function $l_s = 8$.**