Consumer Choice Theory - Review

ECO 305 - Microeconomic Theory

<table>
<thead>
<tr>
<th>Utility maximization</th>
<th>“Dual” expenditure minimization</th>
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</thead>
<tbody>
<tr>
<td>max $U(x_1, x_2)$</td>
<td>min $p_1 x_1 + p_2 x_2$</td>
</tr>
<tr>
<td>subject to $p_1 x_1 + p_2 x_2 \leq M$</td>
<td>subject to $U(x_1, x_2) \geq u$</td>
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</tbody>
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FONC: $\frac{\partial U}{\partial x_i} = \lambda p_i$ $\mu = 1/\lambda$ $\text{FONC: } p_i = \mu \frac{\partial U}{\partial x_i}$

Common SOSC - diminishing MRS

**Marshallian** (uncompensated)

demands $x_i = D^m_i(p_1, p_2, M)$

**Hicksian** (compensated)

demands $x_i = D^h_i(p_1, p_2, u)$

Indirect utility function

$u = U^*(p_1, p_2, M)$ Inverses

Expenditure function

$M = M^*(p_1, p_2, u)$

**Roy’s Identity**

$D^m_i(p_1, p_2, I) = -\frac{\partial U^*/\partial p_i}{\partial U^*/\partial M}$

**Shepherd’s Lemma** \(^1\)

$D^h_i(p_1, p_2, u) = \frac{\partial M^*}{\partial p_i}$

↓

$x_i = D^h_i(p_1, p_2, u) = D^m_i(p_1, p_2, M^*(p_1, p_2, u))$

↓

**Slutsky Equation**

$\frac{\partial D^h_i}{\partial p_j} = \frac{\partial D^m_i}{\partial p_j} + x_j \frac{\partial D^m_i}{\partial M}$

\(^1\)The textbook calls this Hotelling’s Lemma