Microeconomics 1
Revealed Preference Theory
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Revealed Preference Theory

• Previously our study of consumer behaviour has relied on information about a consumer’s preferences and budget constraint to determine demand.

• Under *Revealed Preference*, we show how we can use information about the consumer’s demand to discover information about his/her preferences.
Revealed Preference Theory

• A major critique of the ordinal approach is that the concept of utility is not directly observable.

• Paul Samuelson argued that it is possible to study consumer behaviour without any recourse to the concept of utility at all.

• Thus, revealed preference theory relies on empirical observations of consumers’ choices and consumers’ budget constraints, and uses that information to deduce what they will do in the future.
Revealed Preference Theory

• It’s important to remember that preferences are not directly observable; they are discovered by observing the consumer’s demand.

• A very important assumption: preferences do not change while we observe the consumer’s demand behaviour.
Revealed Preference Theory

• Remember! Individual decision-making is rooted in the standard economic model of *rational choice*.

• Rational choice theory starts with the idea that individuals have preferences and make choices in accordance with these [preferences].

• These choices are made according to some *consistent criteria*. 
Revealed Preference Theory

Preference and Utility

• Suppose X denotes all possible choices available to the consumer; for simplicity, we consider the two-commodity case.

• The elements of X are pairs, say (50 pieces of fried yam, 100 pieces of chicken nuggets); (30 pieces of fried yam, 140 pieces of chicken nuggets); etc. ....
Revealed Preference Theory

Preference and Utility

• Preferences are defined accordingly as follows:

• For example, \((40, 120)\) is better than \((30, 140)\) => 40 pieces of friend yam and 120 pieces of chicken nuggets combination is better than 30 pieces of fried yam and 140 pieces of chicken nuggets combination.
Revealed Preference Theory

Preference and Utility

• Alternatively, we might regard (80,60) and (60,90) to be the same.

• Important point to note: different individuals might have different preference orderings. In other words, a preference order reflects individual’s tastes and subjective evaluation of commodities.
Revealed Preference Theory

Preference and Utility

• All preferences must satisfy the following four (4) axioms:

1. Completeness: all pairs in X are comparable.

2. Transitivity: if pair A is better than pair B, and pair B is better than pair C, then A is better than C.
Revealed Preference Theory

Preference and Utility

• All preferences must satisfy the following four (4) axioms:

3. **Monotonicity**: the more the better.

4. **Convexity**: diversification is desirable; technically, this means \((100,50)\) is better than both \((0,300)\) and \((390,0)\) when \((0,300)\) and \((390,0)\) are the same.
Revealed Preference Theory

Revealed Preference and Normative Preferences

• Revealed preference assumes that the observed actions, which reveal consumer’s preferences must correspond to **normative preferences**.

• Normative preferences represent the consumer’s actual interests or tastes; preferences that represent the consumer’s **true interests**.
Revealed Preference Theory

Revealed Preference and Normative Preferences

• In some situations it makes sense to give revealed preferences normative status.

• Ex. When a 6 year old child chooses chocolate ice cream over vanilla ice cream, she reveals a legitimate preference for one flavour over another. Hence this should be respected and honoured by the ice cream vendor.
Revealed Preference Theory

Revealed Preference and Normative Preferences

• Nevertheless, there are many instances in which even the choices of adult consumers do not reveal a true preference.

• Ex. When a worker invests all their retirement savings in one stock (employer’s stock), economists should not necessarily assume that the worker acted in their best interest.
Revealed Preference Theory

Revealed Preference and Normative Preferences

• In this illustration, where a worker puts all their financial eggs in one basket, he/she is probably revealing many things, one of which is confusion about the risk characteristics of the financial product.

• This highlights a very important point regarding human behaviour.
Revealed Preference Theory

Revealed Preference and Normative Preferences

• That is, human behaviour is jointly determined by both normative preferences and other factors, such as analytic errors, myopic impulses, inattention, passivity, and misinformation.

• What factors create a wedge between revealed preferences and normative preferences?
Revealed Preference Theory

Revealed Preference: Assumptions

- **Stable preferences**: this remain the same whilst we observe consumer’s behaviour.

- **Preferences indicate rational choice**: decisions are based on rational choice theory.

- **Decisions are optimizing**: Rational choice indicate optimized-approach to decision-making.
Revealed Preference: Assumptions

• **Consistency**: consumer’s choice decisions must be consistent.

• **Strict preferences**: we write $A \prec B$ to mean that the consumer likes $B$ strictly more than $A$. Such a strict preference relation is said to be consistent if it is both *asymmetric* and *transitive*.
Revealed Preference Theory

**Revealed Preference: Assumptions**

- **More on Transitive preferences:** A preference relation $\prec$ is transitive if $a \prec b$ and $b \prec c$ implies $a \prec c$.

- **More on Asymmetric preferences:** A preference relation $\prec$ is asymmetric if we don’t allow both $A \prec B$ and $B \prec A$. That is, either $A \prec B$ or $B \prec A$ must always hold for any $A$ and $B$ in $X$ that aren’t equal (completeness).
Revealed Preference Theory

*Revealed Preference Axiom*

• The consumer, by choosing a collection of goods in any one budget situation, reveals his preference for that particular collection. The *chosen bundle* is revealed to be preferred among all other alternative bundles available under the budget constraint.

• The chosen ‘basket of goods’ *maximizes* the utility of the consumer.
Revealed Preference Theory

Revealed Preference Axiom

• Therefore, the revealed preference for a particular collection of goods implies the maximization of the utility of the consumer.

• The concept is illustrated in Figure 1 on the next slide.
Revealed Preference Theory

**Figure 1: Revealed Preference**: the bundle \((x_1, y_1)\) that the consumer chooses is revealed preferred to the bundle \((x_2, y_2)\) that he could have chosen.
Revealed Preference Theory

Revealed Preference

• From Figure 1 we can conclude that all other bundles on or beneath the budget line are revealed worse than the chosen bundle \((x_1, y_1)\). This is because those other bundles are affordable and could have therefore been chosen, but were rejected in favour of bundle \((x_1, y_1)\).
Revealed Preference Theory

The Algebra of Revealed Preference

• With quantities \((x_i, y_i)\) and prices \((p_x, p_y)\), and given income, \(m\), the two bundles can be expressed algebraically as follows:

\[
    m y p x p y x \leq \frac{1}{2} m y p x p y x \leq \frac{2}{2}
\]

• For the chosen bundle \((x_1, y_1)\), this condition must be satisfied \(p_x x_1 + p_y y_1 = m\), whilst for the other bundle this condition must be satisfied \(p_x x_2 + p_y y_2 \leq m\)
Revealed Preference Theory

The Algebra of Revealed Preference

• Thus putting these two bundles together, the fact that \((x_2, y_2)\) is affordable at the budget \((p_x, p_y, m)\) means that

\[
p_x x_1 + p_y y_1 \geq p_x x_2 + p_y y_2
\]

• If the above inequality is satisfied and \((x_2, y_2)\) is actually different from \((x_1, y_1)\), we say that \((x_1, y_1)\) is *directly revealed preferred* to \((x_2, y_2)\).
Revealed Preference Theory

The Principle of Revealed Preference

• Let \((x_1, y_1)\) be the chosen bundle when prices are \((p_x, p_y)\), and let \((x_2, y_2)\) be some other bundle such that
\[
p_x x_1 + p_y y_1 \geq p_x x_2 + p_y y_2
\]

• Then if the consumer is choosing the most preferred bundle s/he can afford, we must have \((x_1, y_1) \succ (x_2, y_2)\)
Revealed Preference Theory

The Principle of Revealed Preference

An important point worth noting!

• If oat porridge is revealed preferred to maize porridge, it doesn’t automatically mean that oat porridge is preferred to maize porridge. This is because ‘revealed preferred’ just means that oat porridge was chosen when maize porridge was affordable (and available).
Revealed Preference Theory

**Indirect Revealed Preference**

- Previously, we noted that \( (x_1, y_1) \succ (x_2, y_2) \)

- But, suppose we know that \((x_2, y_2)\) is demanded at prices \((q_1, q_2)\) and that \((x_2, y_2)\) is itself revealed preferred to some other bundle \((x_3, y_3)\).

- That is, \( q_1 x_2 + q_2 y_2 \geq q_1 x_3 + q_2 y_3 \)
Revealed Preference Theory

*Indirect Revealed Preference*

• Then, if we know that \((x_1, y_1) \succ (x_2, y_2)\), and that \((x_2, y_2) \succ (x_3, y_3)\)

• Then based on the transitivity assumption, we can conclude that \((x_1, y_1) \succ (x_3, y_3)\)
Revealed Preference Theory

**Indirect Revealed Preference**

• Hence, from revealed preference and transitivity, we can conclude that \((x_1, y_1)\) is *indirectly revealed preferred* to \((x_3, y_3)\).

• In Figure 2 we depict the idea of indirect revealed preference, where the bundle \((x_1, y_1)\) is indirectly revealed preferred to \((x_3, y_3)\).
Revealed Preference Theory

Figure 2: Indirect Revealed Preference

Hence, from revealed preference and transitivity, we can conclude that \((x_1, y_1)\) is indirectly revealed preferred to \((x_3, y_3)\).

In Figure 2 we depict the idea of indirect revealed preference, where the bundle \((x_1, y_1)\) is indirectly revealed preferred to \((x_3, y_3)\).
Revealed Preference Theory

Revealed Preference

• Thus, if a chosen bundle is revealed preferred, either directly or indirectly, to all other bundles that were available but not chosen, then we can conclude that the chosen bundle is in fact preferred to those bundles.

• Revealed preference is thus useful in designing economic policies, especially those involving trade-offs in consumption, such as a subsidy or tax.
Revealed Preference Theory

Revealed Preference

• For example, we know that a subsidy or tax can result in more or less of a commodity being produced, and therefore be available for consumption.

• Information about the nature of consumers’ preferences between several commodities in consumption is useful in evaluating the desirability or otherwise of a particular policy.