Difference Between Cardinal and Ordinal Utility

Introduction to Cardinal Utility and Ordinal Utility

Utility is a physiological fact that implies the wanting the satisfying power of a good or service. It differs from person to person, as it relies on a person's mental attitude. The measurability of utility is always a controversial subject. The two primary theories for utility are Ordinal Utility and Cardinal Utility. Many traditional economists proposed a view that utility is measured quantitatively like length, height, weight, temperature, etc. This concept is termed a Cardinal Utility. On the other hand, Ordinal Utility expresses the utility of a commodity in terms of more than or less than. Read the article below to understand the difference between Cardinal Utility and Ordinal Utility.

What is an Ordinal Utility?

Ordinal Utility states that the satisfaction a consumer gets after consuming a good or service cannot be scaled in numbers, whereas, these things can be arranged in the order of preference. Two English economists, John Hicks and R.J. Allen 1930 argued that the consumer behavior theory should be introduced based on Ordinal Utility. According to the ordinal approach, utility is a psychological phenomenon like happiness, satisfaction, and welfare. The ordinal theory is highly subjective and differs across individuals. Therefore, it cannot be measured in quantifiable terms.

The function that represents utility of a product according to its preference, but does not provide any numerical figure, is known as an Ordinal Utility. In simpler words, this theory affirms that it is relevant to ask which item is better as compared to others instead of how good is that product. For example, a BMW car is favored more than a Toyota car, but it cannot be determined by what percentage.

Apart from showing a mathematical function, a consumer's preference can be demonstrated graphically through indifference curves. It becomes easy when there are two types of commodities x and y. Each indifference curve provides coordinates (x,y) when (x1, y1) and (x2, y2) lie on the same curve line and (x1, y1) ~ (x2, y2).

This is an example of an indifference curve map where the preference of goods are shown but not their quantity. Each of the curves represents a combination of two services or goods. The consumers are equally satisfied with the goods and services. The more distant a curve is from the origin, the higher its utility level.

The utility according to this approach can be measured in relative terms such as less than and greater than. This approach states that consumer behavior can be explained in terms of preferences or rankings. For example, a consumer may prefer soft drinks over hard drinks. In such a case, the soft drink would have 1st rank, while 2nd rank would be given to hard drinks

Therefore, as per the Ordinal Utility approach, a consumer observes different pairs of two commodities which would provide him/her the same level of satisfaction. Among these pairs, he/she may prefer one commodity over the other based on how he/she ranks them in order of utility. This implies that utility can be ranked qualitatively rather than quantitatively.

Do you know: In 1934 John Hicks and Roy Allen produced the first paper which declared Ordinal Utility.

(Image will uploaded soon)

What is Cardinal Utility?

According to classical economists, utility is a quantitative concept that can be measured in terms of a number. Hence they introduced the concept of measuring utility using a cardinal approach. According to this concept, the utility can be expressed similarly to how weight and height are expressed. However, the economists lacked a precise unit for utility. Hence, they derived a psychological unit termed as 'Util'. Util is not regarded as a standard unit because it varies from person to person, place to place, and time to time. For example, if a person assigns 30 utils to a pizza and 20 utils to a chowmein, we can understand that the pizza has double the capacity to satisfy what humans want.

As util is not a standard unit for measuring utility, many economists, including Alfred Marshall suggested measurement of utility in terms of money that consumers are willing to pay for a commodity. If each rupee is equal to 1 util, a pizza worth Rs 30 has 30 utils and a chow min worth Rs 20 has 20 utils. Hence, the consumer who consumes burgers will yield utility of 30 utils and those who consume chow min will yield utility of 20 utils.
The supply and demand of a product decide its price. Moreover, a person's desire for a product depends on these three factors:

- Price of the item
- Income of a person
- The cost of other related items

Application of Cardinal Utility

Following are the different applications of Cardinal Utility:

Welfare Economics: Under this structure, the production of goods and providing services are judged by the personal wealth of an individual. This means that it presents a way to comprehend the “greatest good to the greatest number of persons”. For example, by this act, a person’s utility decreases by 75 utils and increases two other persons each by 50 utils. However, the overall increase is 25 utils which is a positive offering.

Marginalism: In cardinal theory, a product’s marginal utility sign is alike for all the mathematical forms, but its magnitude is not the same. This applies to the second derivative of a differentiable utility as well.

Expected Utility Theory: This framework works for settlements that are to be made under risks. Suppose there are a few lottery tickets that will provide outcomes. Here, it is possible to plot preferences in real numbers so that numerical representation can be done.

Intertemporal Utility: In various representations of utility, where people deduct the upcoming values of utility, cardinality comes into play. With the use of this, it is feasible to generate proper utility functions.

Differentiate between Cardinal and Ordinal Utility in Tabular Form

Basis of Comparison	Cardinal Utility	Ordinal Utility
Meaning	Cardinal Utility is the utility where the satisfaction derived by consuming a product can be expressed numerically.	Ordinal Utility is the utility where the satisfaction derived by consuming a product cannot be expressed numerically.
Approach	Quantitative	Qualitative
Evaluation	Utils	Ranks
Examination	Marginal Utility Analysis	Indifference Curve Analysis
Promoted By	Traditional and Neo Classical Economist	Modern Economist
Realistic	Less	More

Key Difference between Cardinal Utility and Ordinal Utility:

- Cardinal Utility is a utility that determines the satisfaction of a commodity used by an individual and can be supported with a numeric value. On the other hand, Ordinal Utility defines that satisfaction of user goods can be ranked in order of preference but cannot be evaluated numerically.
- The measuring term for cardinal and Ordinal Utility is utils and ranks respectively. Utils is the unit of utility and ranks determine the preference of a product compared to other products in the market.
- Ordinal Utility measures the utility of goods subjectively, but Cardinal Utility evaluates objectively.
- Cardinal Utility is not much realistic as compared to the Ordinal Utility as quantitative evaluation of utility is not practicable. Ordinal Utility depends on qualitative measurement, which makes it more realistic.
- Another difference between ordinal and Cardinal Utility is that the former one is based on indifference curve analysis, and the latter is based on marginal utility evaluation.
- Alfred Marshall and his admirers presented the Cardinal Utility approach, and Hicks and Allen pioneered the Ordinal Utility idea.

Another point that can be considered as a difference between cardinal and Ordinal Utility is that ordinal evaluation is sure to give outcomes. The Ordinal Utility is preferred more because it provides more robust results. Conversely, the concept of Cardinal Utility is obsolete, but still, it is used for contexts like discounted utilities, making settlements under risk and utilitarian welfare calculations.

Conclusion

Cardinal and Ordinal Utility are two important theories of utility. Cardinal Utility provides a value of utility to different alternatives. In other words, it enables consumers to rank the magnitude of how much they prefer one good over another. On the other hand, Ordinal Utility ranks in the order of preference. The Ordinal Utility does not permit consumers to rank the magnitude of how much they prefer one good over another.

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