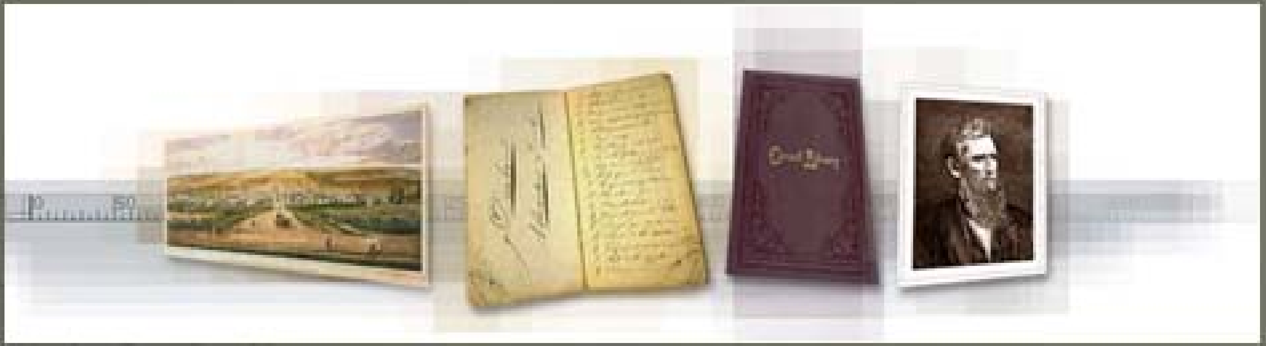

Building A Social Menu

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ABSTRACT

A multiple-choice menu is a list of items ordered by type and quantity to enable someone to choose which items he prefers. Choosing items from a menu implies first putting them in some sort of order and then expressing a preference. To do this the person choosing has in front of him the list of a goods, and what he does is combine them in the way that suits him best. The manner of ordering and combining the goods available in the series constitutes the sequence of consumption over a specific period and it is this which determines the level of utility.

INTRODUCTION

Consumer microeconomics studies the level of satisfaction or utility experienced when someone consumes one or a series of goods. Utility is thus a function of the nature of the good in question and the amount consumed. Once the business of measuring utility has been dealt with, the next step is to determine what criteria are employed in establishing an order of preference. It is logical to assume that one good is preferred to another or, in the case of a particular good, a certain amount of that good is preferred to another amount.

It would be a major step forward if we could apply analytic tools to combinations of choice for the purpose of analysing consumption. There is no difficulty in saying that the consumption of good *a* and good *b* can be expressed as follows: first *a*, second *b*, i.e. (a, b). Or it may be the other way around: first *b*, second *a*, i.e. (b, a). The important point is that each combination or order results in a different level of utility, though we may admit the oddity where consumer preference results in an equal level of utility.

The range or set of goods available and, in particular, the way they can be combined allow us to develop specific alternative menus for each person and select the menu which we regard as the optimum.

From the single menu we move on to the social menu, i.e. the best menu for a collective or a citizenry, a complex and difficult field.

COMBINATIONS

In mathematics combination theory looks in general at how individual elements of a combination are ordered and combined. Analytic fields cover such concepts as groups containing all components none of which is repeated, all some components some of which are repeated, *some* components *with* repetition, etc. It is an approach that can handle real-life cases in which all goods are ordered without a single repetition. It is a simple and effective means of study from which we obtain interesting results.

Combination theory is the name given to this general approach which covers all cases and, specifically, regular permutations, to analyse the practical case just stated: all components are present without a single repetition and so all possible combinations can be analysed. This analytic field is known as a *regular permutation*.

Its definition is as follows: given a set A of components, each of the combinations in which all the components of A are found is called a regular permutation type n. Algebraically, this is written:

$P_n = n!$ (1)

which gives the number of different orders in which n components can be arranged. In this article we will refer to regular permutations as combinations, arrangements or orders.

WHAT IS A COMPLETE INDIVIDUAL MENU?

A complete menu is a list of options available to a consumer of goods in which no possible combination is missing.

To define it we use two knowns: first, the set of goods available to the consumer and, second, the time available for their consumption. With these goods the subject establishes a certain order which need not entail the immediate or mandatory consumption of the goods in question. The order of goods so established is done in such a way that none of the goods is missing. Furthermore, and this is the important point, each arrangement, the result of a specific order, determines a level of utility.

In this sense each order of goods is equivalent to consuming a different good. This allows us to call each order a separate good, i.e. an entity that is different from the goods comprising the set. For example, if the goods are films and ice cream (a, b) or ice cream and films (b, a) these two arrangements both constitute separate goods: good A is (a,b), good B is (b,a) and neither good A nor good B is the same as *a* or *b*.

Given that each order is equivalent to a separate good, there will be as many different goods as there are orders (number of regular permutations). For example, if there are ten goods, the number of orders will be:

$10! = 10.9.8.7.6.5.4.3.2.1$

With 10! different orders we have 10! different goods. These 10! goods will all be different from each other and from the ten goods comprising the initial set.

MENUS, UTILITY, AND LADDERS

Once the subjects have decided on their menus, i.e. they have posited all possible combinations (permutations), they then establish a series of preferences before consuming the menu they consider best. What menu is considered best? That which procures the highest level of utility possible. In other words, the one preferred to all the rest.

Measuring utility is inevitably a vexed question. Ambiguity and uncertainty are always present. However, practical approaches such as the one described here, can help.

Consumers are the sole witnesses of their own level of utility, so measuring that utility can never be an objective exercise. What can be established, however, is a criterion of preference. And this preference criterion allows us to establish a utility ladder such that each order or combination is tied to a level of utility that cannot be measured or compared. The important point is that each permutation is tied to a level of utility and each utility can be preferred to another or, put another way, can be referenced to all other utilities. Once referenced in this way, each utility level will have its specific order and represent a rung on a ladder. And on that ladder the number of each rung (not a cardinal but an ordinal number) will bear a specific relationship with the levels of all other rungs.

Seen from this angle, we can call menus ladders. For example, we can opt to call one combination A, and another B, and so on in succession (A, B, C, D, … Z), always remembering that each group implies a combination of all the goods in the set. If in addition, to facilitate analysis, we rule out the possibility of two or more combinations having the same level of utility, each group will have a level of preference with respect to all other groups. Thus, the group of goods comprising Group C and its respective level of utility can be assumed to be preferred to D and preferred slightly less than B. Given that A is preferred in terms of utility to B, we can say that A is preferred to C. The approach thus meets the need for transition.

So, to summarise: each consumer activity involves all the goods. However, if we say that utility is a direct function of the combination of those goods, there will be as many rungs on our ladder as there are combinations. Once we have established the combinations we have established the preference criterion, which is transitional and can therefore be used to construct of ladder or scale of utility. Note that this statement is valid for a single consumer, not for a group of consumers.

DETERMINING THE OPTIMUM MENU

By deduction or intuition, the optimum menu is determined by the combination of goods that produces the level of utility referenced by all other combinations. If we stick our necks out and use that ambivalent expression 'measuring utility', we can say that the optimum menu is that which generates the highest level of utility.

If by definition the optimum menu is 1, the number of the less than optimum menus will be: n!–1.

The steps needed to find the optimum menu are as follows. First we evaluate quantitatively and qualitatively the goods. Next we list all the possible combinations. Then we establish a link between the combinations of goods and the level of utility. And, lastly, we establish a system of preference among the various levels of utility. At this stage, consumers are in a position to choose. Their choices will determine which menu, of all those available, is most often preferred. This, the *most* preferred menu, is the optimum menu.

CHANCE, PROBABILITY

In building the menus and, above all, in choosing the best or optimum menu, we use rational criteria. These are both transitive and, in the sense that the chooser is the sole witness of the utility he or she obtains, subjective. An interesting question we may ask ourselves is whether, in order to find the optimum menu, rational choice is preferable to random choice

If we put in a hat a number of slips, precisely n! number of slips, on each of which is one choice and ask someone to pull one out at random, what are the chances of them pulling out the optimum menu? The probability is:

Probability = 1/n!

The greater the number of goods the remoter the probability. The highest probability of obtaining the optimum menu is if there is only one or two goods. When there is only one good, the probability is one, in which case the concept of chance or learning does not enter. In the case of two goods, the probability is one half, in which case it is indeterminate.

Leaving aside these two cases, it will always be preferable to construct the menu using rational criteria rather than leaving it to chance, given that rational behaviour will lead to obtaining the optimum menu.

TIES

Given a set of goods and therefore n! combinations, we use the expression 'tie' to define an internal combination group which is outstandingly preferred in each combination. If n´ is the number of goods in a combination or sub-combination, and n is, as stated, the total number of goods in the set, then: n´< n. We envisage two menu types: an intermediate menu or sub-menu and a universal menu which includes all the goods in the set. A 'tie' is a combination pertaining to a submenu which is greatly preferred to all others. It is not hard to imagine that given the goods and the possible combinations available, ties are the result of the respective utilities being interdependent.

The presence of ties reinforces the idea that a combination which contains a tie will be preferred to one that does not. The presence of a tie complicates the possibility of negotiating combinations among a group of consumers or between one group of consumers and another.

LEARNING AND PUZZLES

The menu comprises a set of goods which make up what we call the *landscape*. Another way of looking at it is to say that the menu is a jigsaw puzzle made up of pieces whose combination defines the landscape. The way in which the pieces fit together results in a specific combination which, were the pieces combined any other way, they would not fit in to the landscape.

Let us stay with the jigsaw idea for a moment. A menu, like a jigsaw puzzle, is essentially a problem of combination. To be more precise, it is a series of regular permutations in which all the pieces are involved, in which there are no duplicate pieces, and in which the combination of all them comprises the optimum menu. When doing a jigsaw puzzle we find there are economies of scale which have their equivalent in building a social menu. They are as follows.

There is a learning curve in the process of doing a jigsaw which develops as the puzzler advances in the construction task. In similar fashion, consumers become 'wiser' in creating social menus.

First. In making the puzzle the puzzler-consumer gradually becomes an efficient puzzle-maker.

Second. At the outset the problems in fitting the pieces of the puzzle together are considerable, but as work progresses the pieces seem to fit together much more easily.

Third. The final piece requires no effort, knowledge or learning.

Forth. The difference in effort between fitting together two successive pieces is the marginal effort, which is diminishing.

The conclusions obtained from doing a jigsaw are similar in many ways to that of constructing an optimum social menu. The difference between one and the other is that with the pieces of a jigsaw you can make only one jigsaw, whereas with the pieces of a social menu you can build multiple menus, only one of which will be the optimum menu.

BUILDING A SOCIAL MENU

Building a social menu that is valued by everybody to the same degree is practically impossible as it is most unlikely that that everyone will agree on a single given combination. The task is thus a complex one, from both a democratic and a mathematical standpoint.

In fact, there will be no massive vote for one single combination, with the result that we have to look for less-than-optimum solutions, such as second best or third best.

Before going any further, we ought to take into account a thorny problem which is Arrow's voting paradox, first published in his work *Social Choice and Individual Values* in 1951. What Arrow said was that the preferences of a community cannot be expressed unequivocally and usually give rise to the voting paradox. Just what is this paradox? Let us suppose that there are three political programmes, A, B and C, and three groups of voters of equal number, 1, 2 and 3. Let us also suppose that Group 1 prefers A to B and B to C. Group 2 prefers B to C, but C to A. And Group 3 prefers C to A and A to B. The paradox resides in the fact that A is preferred to B by the majority (Groups 1 and 3), in the same way that B is preferred to C (by Groups 1 and 2). However, there is also another majority (Groups 2 and 3), which prefers C to A.

Here we would comment that, aside from the insuperable obstacle of Arrow's voting paradox, combinatory theory in itself enshrines major obstacles to consensus agreement. Also that, oddly enough, it is combinatory theory that will help us to overcome the voting paradox.

In the unlikely event of an indifferent Leviathan offering goods, it is unlikely, not to say impossible, that there would be an optimum menu preferred by all members of the social group. The outcome would thus be negotiation.

In the process of negotiation attention would eventually turn to two or more combinations which meet most of the demands of the different groups. Given that it is unlikely that *long* combinations (those made up of many elements) meet requirements, these and other *non grata* combinations will be eliminated. Groups will agree to negotiate provided that there is agreement on *non grata* combinations and there are also two or more combinations that can be seen as second best, third best, to the power of *n* best.

Where a person or a subgroup reveals strong preferences for one or more combinations, as in the case of ties, negotiation proves more arduous. After all, negotiating requires a series of concessions, and ties make concessions much more difficult to make.

The problem is worse if groups are strong in number and/or power, and reveal ties in their preferences. This, plus the voting paradox, makes it extremely difficult to arrive at an optimum social menu by means of negotiation.

What we put forward, however, is a possible means of negotiation, though first we have to make the following observation: there are two factors that increase the wellbeing of an individual or group. The first is the number of goods available to him/it; the second is the presence of optimum or near-optimum combinations. On this basis we can say that there is usually an alternative to hand: surrendering some goods to another group in exchange for them surrendering or making available other combinations.

Seen in this way, the possibilities of a dynamic and fluid negotiation among groups to reach an optimum social menu is a very real possibility. What is more, the presence of one or more combinations that are significantly preferred to others will allow all parties to ascend a ladder of utility and descend on the other side (surrendering certain goods which do not enter into the sub-combination of goods obtained). At the end of the process there will be net gains (the number of rungs surmounted). Those who receive goods, in the sense of allowing themselves to be bribed, can then make new combinations with the goods thus obtained and improve the utilities they hold (i.e. climb more rungs).

By this means a way forward is obtained in negotiation and, in particular, a means of improving the utilities available to the social universe, i.e. obtain the utilities pertaining to the preferred combinations.

CONCLUSION

Utility cannot be measured but it can be preferred to another level of utility and, as a result, it is possible to construct a ladder or scale of utility. Utility depends to a large extent on the way various goods are combined. Such combinations refer to the different placements of a group of goods consisting of all goods but no repetitions, in other words, regular permutations.

Consumers will always search for a combination which offers a level of utility that is superior to any other. To this end they will study all combinations and, then, choose the best. Thus, it is always, or nearly always, better to allow this choice to be made rationally than to search for an optimum menu by means of chance.

Searching for an optimum social menu is complicated by the consumers' varying tastes when it comes to preferences. The opportunity each group has to be able to surrender certain numbers of goods in exchange for preferred combinations should allow us to overcome the difficulties involved in negotiation.

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