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The Giffen Goods Phenomenon in the Austrian School Perspective

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Abstract

The Giffen good was used to attack Praxeology and the Austrian school of economics. It is shown that with a specific value scale along with pure Austrian analysis the existence of Giffen goods can be predicted. It is explained that the traditional Rothbardian's methods to investigate human preference and action is inadequate to analyze preferences between complex bundles of goods, which is required in the analysis of Giffen goods. Therefore, the Rothbardian's preference schedule table is replaced with a two-dimensional ranking matrix, which takes into account *all* the possible bundles of goods. It is shown that under Austrian analysis, without utility functions and indifference curves, at least in theory, under certain conditions (specific preference schedule and money restrictions) an upper sloping demand curve, which is a fingerprint of Giffen goods, is possible. Therefore, not only doesn't the existence of Giffen goods contradict Austrian economics, but Austrian economics can predict the existence of Giffen goods.

Keywords

Giffen Good, Austrian School, Giffen Paradox, Subjective School, Rothbard, Preference Schedule

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1. Introduction

A Giffen good is a living Economic Chimera. It is a good whose mere existence is a contradiction to one of the main "laws" of economics – the law of demand [1] – when prices go up demand goes down [1-2]. This is one of the fundamental laws that any child can grasp very quickly. And yet, the existence of Giffen goods invalidates it. Therefore, it is no surprise that its existence was not predicted using basic principles, but rather it was "discovered" by observation. Giffen good is named after Sir Robert Giffen, who observed [3] a strange anomaly (or "paradox") in the Victorian era poor's population (it should be stressed that some attribute this observation to Gray [4]). He noticed that when the price of some inferior goods rises, the demand for them increases as well. Evidently, this conduct contradicts the law of demand, which predicts a decline in the demand for the product.

The existence of Giffen goods is debatable [2, 5-16], since like any economic observation it can be interpreted in many ways; however, there is no considerable debate about the theoretical possibility of a Giffen good. As a consequence it was used as a tool for attacking the Austrian school of economics, for, unlike neoclassical economists, they take the diminishing marginal utility law as a universal economic law. However, these arguments were rebutted by pointing out that while the law of diminishing marginal utility is a praxeological law, and therefore universally valid, the "law" of demand is neither a law nor is it a universal truth, at most it is a statement that holds true in most cases, and therefore it falsification does not jeopardize any praxeological truth [17, 18]. Furthermore, it was correctly stated that the scenarios, in which Giffen goods are present, do not challenge the individual of choosing between uniform goods, as does the

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law of diminishing utility. Instead, the individual must choose between bundles of goods, for which case this law (i.e., diminishing utility) cannot apply [19].

Therefore, Giffen goods do not pose any threat neither to Praxeology nor to the Austrian school of economics. Yet, it is quite surprising that Giffen goods does not appear in most economists' writings of the Austrian school. In particular, it is totally absent in Mises Magnum Opus "Human Action" [20] nor does it appear in Rothbard's "Man Economy and State" [21].

Rothbard's silence on the issue is even more disturbing, for he is well known for his ferocious attacks against anything that challenges the Austrian's school. But a careful observation of the Rothbardian methods may explain this, since he investigated only relatively simple scenarios, which can be analyzed with a simple preference schedule. The existence of a Giffen good is not such a case, since it requires at least three parameter and at least three different goods: A normal good, a Giffen good and Money as a third good. Even if we choose to simplify the scenario by assuming that the individual does not have a demand for money but only for the goods (this sounds like a good assumption in the case of an impoverished population), then still the amount of money in his possession poses a restriction on his options, and therefore must be taken under consideration, which complicates the analysis.

2. The Rothbardian's Tables

The shortcoming of the Rothbardian's method in analyzing this kind of problems can be illustrated in the following example. Figure 1 is the values scale of an individual, which is based on Rothbard's Figure 4 of Ref. [21]. In this figure the value scales of the ends of each unit of two goods (X-horses and Y-cows) are presented on the same plot (in [21] they are plotted on different graphs). The *y*-axis has only ordinal significance, i.e., it is clear that the individual with this value schedule values the end from the 4^{th} unit of good X more than he values the end from acquiring the 5^{th} unit of good Y.

Rothbard then uses this preference schedule to investigate different scenarios. For example, suppose a person has 3 units of X and 3 of units of Y and faced with the choice of adding one unit of X or one unit of Y. Then, since the "marginal utility of the increased X is greater than that of Y", he will prefer adding a unit of X instead of unit of Y.

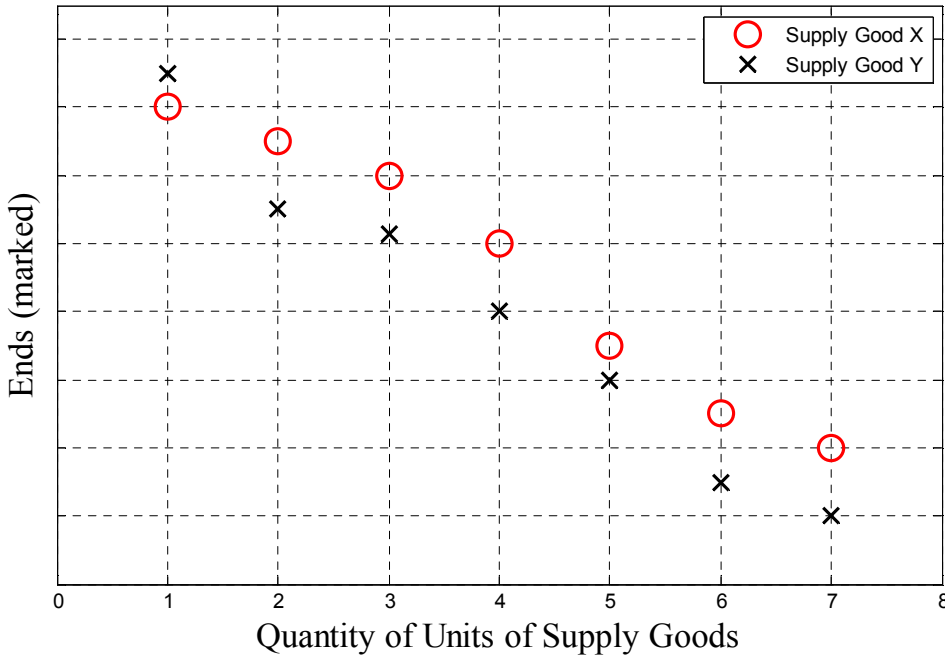

Figure 1. Value scales (based on Figure 4 of [21]).

In other places Rothbard uses a different ranking method, when he wants to rank high value goods (such as horses) along with low value ones (say, fish). In these cases he put on the same rank schedule *bundles* of the low value good (bundles of barrels of fish) along with *single* units of the high value ones (horses). An example of such a value scale is presented in Table 1 (a similar table can be found in Figure 16 of Ref. [21]).

The former presentation can help to decide between simple decisions, when the amount of goods changes by a single unit but it cannot help the individual decide between more complicated decisions. For example, it is clear that the first

unit of Y is preferred over the first unit of X, but are two units of Y's preferred over two units of X's or vice versa? Should the individual with the value scale of Figure 1 prefer 2X and 2Y over 1X and 3Y?

Table 1. A value scale of an individual.

Ends	Rank
1st unit of Y	1
100 units of X	2
99 units of X	3
98 units of X	4
2nd unit of Y	5
97 units of X	6
96 units of X	7
3rd unit of Y	8
95 units of X	9
94 units of X	10
93 units of X	11
92 units of X	12
4th unit of Y	13
91 units of X	14

Such ends value ranking (Figure 1) cannot answer this sort of questions. The ranking must take into account *all* possible bundles (under the given income restrictions).

The latter presentation (Table 1) can help to determine the price of the high value good (in terms of the low value good, and vice versa), but again cannot distinguish between different kinds of bundles of goods. For example, it is clear that the first units of Y (the first horse) is preferred over 99 units of X (99 barrels of fish), and that 99 units of X are preferred over the second unit of Y, but how can we tell whether 198 units of X are preferred over two units of Y?

Since this kind of questions is exactly what is required in analyzing Giffen goods, one needs a different kind of value scale presentation.

3. Two-Dimensional Value Scale (Ranking) Matrix

We follow Refs. [22] and [23] and choose a presentation, which takes account of all the possible bundles of units of good. Figure 2, is an example, where every combination of bundles has a unique ranking. Therefore, the preference schedule is presented as a two-dimensional (in the two goods case) matrix. Every element in the matrix is characterized by its indices: the columns index indicates the number of units of good X and the rows index indicates the number of units of good Y. The value at each element is the bundle's ranking.

If one propagates on the matrix by moving one step at a time, and in each step taking the one toward the matrix element with the maximum ranking, he then visits all the elements, which are marked by circles. It is important to note that these elements are exactly the ones that appear in Rothbard's value scale tables. This is the reason that the Rothbard's tables can be used in deciding between bundles, which are close to this *maxima trail*. It can be used to decide between the bundle 4X and 3Y (ranked 36) and the bundle 3X and 4Y (ranked only 35). It is also important to point that on the *maxima trail* itself the decision is trivial; for example, it is clear that the bundle 3X and 3Y is better than the bundle 3X and 2Y.

The problem is, that the Rothbardian's approach cannot help in deciding between, e.g., the bundle 6X and 2Y and the bundle 2X and 6Y, while from Figure 2 it is clear that the latter (ranked 40) should be preferred over the former (ranked 38).

The ranking schedule could have been quite different but with the same maxima trail. The Rothbardian's table would look exactly the same for the ranking schedule of Figure 3 but then the answer to the last question would be different: in this scenario 6X and 2Y (ranked 41) are preferred over 2X and 6Y (ranked only 38).

We therefore see that the Rothbardian's approach is inadequate to analyze complicated scenarios where the actor has to decide between bundles of goods.

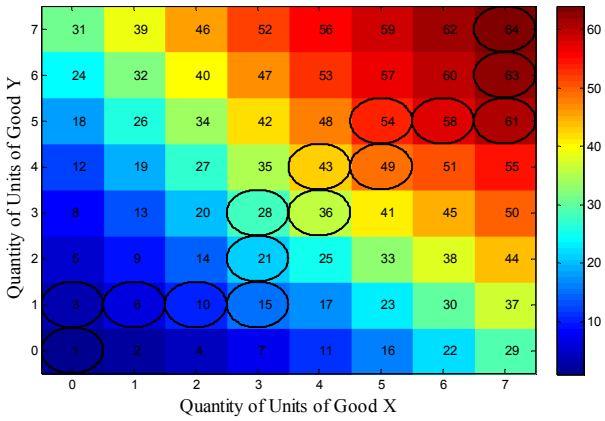

Figure 2. Preference schedule of bundles of two kinds of goods (X and Y).

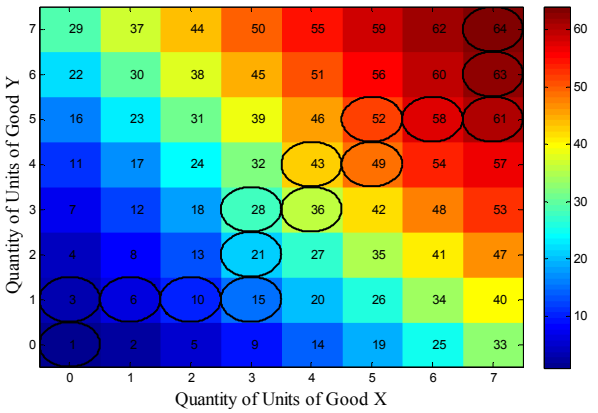

Figure 3. A different preference schedule of the same bundles of goods (X and Y).

That may explain that during the 20th century the arena of the Giffen debate was left to the neoclassical, and therefore the common justification for Giffen good is based on utility functions and indifference curves [1, 8-16]. These two concepts are alienated to the Austrian ear.

Furthermore, it was claimed that people could avoid the Giffen trap, by insuring themselves (in numerous ways) against possible price changes [11]. Even if this claim is true, Austrian analysis treat real men rather than ideal player, and therefore cannot presuppose the existence of such insurances.

It is the object of this paper to present a rigorous Austrian treatment, without the need for utility functions (such as the Neumann-Morgenstern utility function [24]) nor for indifference curves, for the justification of the presence of a Giffen good.

4. Prediction of a Giffen Good from a Value Scale Matrix

Let us define a scenario, in which an individual has a fixed amount of money, with which he can purchase two types of goods: Type A and Type B. We further assume that he does not have a demand for money for future consumption, and that he spends all his money on these two goods.

As a result, his preference schedule can be presented as a two-dimensional matrix. Every element in the matrix corresponds to a specific bundle of the two goods: the column index stands for units of commodity A, while the rows index stands for units of commodity B. The matrix is obviously infinite, however, most of it is irrelevant to the problem at hand due to the fact that the individual possess a finite amount of money and therefore most of the elements beyond a certain value are inaccessible, and may be regarded as no more than wishful thinking, and therefore can be omitted from the analysis.

In Figure 4 such an example of a preference schedule matrix is presented. In this example there are no more than 5 units of each good – commodity A and commodity B. The value of every element of the matrix determine the ranking of the specific option. For example, 3 units of commodity A plus 2 units of commodity B is ranked higher than the case where there are 2 units of commodity A and 3 of B.

The indexes of this matrix, a and b denote the number of units of commodity A and B respectively.

Since the object of the study is to investigate the individual demand curve as a function of the price level, it is therefore taken that the price level affects the individual action but cannot be influenced by it. Using Rothbardian's or Misesian's analysis – we use the ceteris paribus assumption that the only thing that varies is the price of *one* of the goods (say B).

In any specific case the individual chooses the option with the highest ranking, however, two parameters affect his options: his initial wealth (amount of money in his possession) and the price level of commodity B.

Without loss of generality we can assume that the initial price level is p=1, i.e., every unit of B can be traded for a single unit of A. If this is not the case, then, at least in principle, the size of a single unit can be modified to maintain this relation. There is nothing unique about the definition of prices, since the units themselves can be arbitrarily defined. Only the change in the prices are relevant to the discussion at hand.

Let us further assume that this individual possess an amount of money, which is equivalent to m units of commodity A. Therefore his options are limited to the triangle

$a+b \le m$. However, since the utility of the goods increases with the number of units, the highest ranking in this triangle is located on the diagonal where $a+b \cong m$.

In the example presented in Figure 4 we assume m=5. In this case the highest ranking is R=21, which corresponds to $a=4$ and $b=1$ (see the dashed line in Figure 4).

When the price of commodity B rises by 50% from p=1 to p=1.5, which means that 5 units of A can purchase only 3.33 units of B, then the options are bounded by the triangle

$a+pb=a+1.5b \le m$, in which case the maximum ranking reduces to 16, which corresponds to $a=2$ and $b=2$ (see the solid line in Figure 4).

When the price increases by 67% to p=5/3 the maximum ranking reduces further to 13, which corresponds to $a=0$ and $b=3$ (see the dotted line in Figure 4).

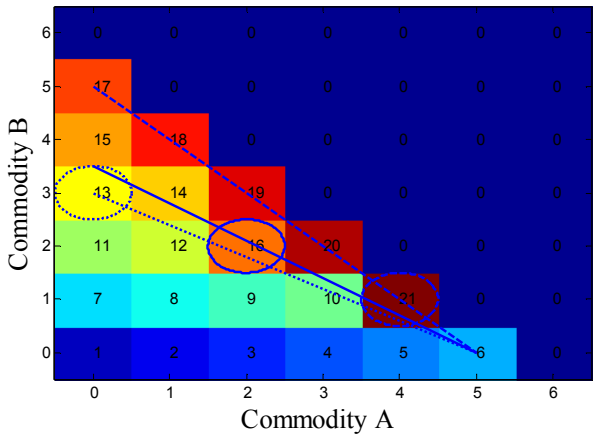

Figure 4. Preference schedule of bundles of two kinds of commodities (A and B) under the income constrain. The dashed, solid and dotted lines correspond to the price level p=1, 3/2, and 5/3 respectively.

Rothbard's table for the price level p=1 is presented in Table 2.

Table 2. A table (Rothbardian) presentation of the value scale (and total cost for p=1) of Figure 4.

Units of A	Units of B	Total Cost	Ranking
			:
			22
4	1	5	21
3	2	5	20
2	3	5	19
1	4	5	18
0	5	5	17
2	2	4	16
0	4	4	15
1	3	4	14
0	3	3	13
1	2	3	12
0	2	2	11
3	1	4	10
2	1	3	9
1	1	2	8
0	1	1	7
5	0	5	6
4	0	4	5
3	0	3	4
2	0	2	3
1	0	1	2
0	0	0	1

In this table the inaccessible options (due to their higher cost) are marked by dark rows. We clearly see that the option with the highest ranking is $R(4,1)=21$.

When the price increases to p=3/2=1.5 the total price increases and less options are open. In which case the $R(2,2)=16$ is the accessible option with the highest ranking (see Table 3).

Table 3. Same as Table 2 but for the price p=3/2.

Units of A	Units of B	Total Price	Ranking
			:
			22
4	1	5.5	21
3	2	6	20
2	3	6.5	19
1	4	6	18
0	5	7.5	17
2	2	5	16
0	4	6	15
1	3	5.5	14
0	3	4.5	13
1	2	4	12
0	2	4	11
3	1	4.5	10
2	1	3.5	9
1	1	2.5	8
0	1	1.5	7
5	0	5	6
4	0	4	5
3	0	3	4
2	0	2	3
1	0	1	2
0	0	0	1

And finally, for p=5/3~1.67, the situation is worsen and the best ranking reduces to $R(0,3)=13$ (see Table 4).

Table 4. Same as Table 2 but for the price p=5/3.

Units of A	Units of B	Total Price	Ranking
			:
			22
4	1	5.67	21
3	2	6.33	20
2	3	7.00	19
1	4	7.67	18
0	5	8.33	17
2	2	5.33	16
0	4	6.67	15
1	3	6.00	14
0	3	5.00	13
1	2	4.33	12
0	2	3.33	11
3	1	4.67	10
2	1	3.67	9
1	1	2.67	8
0	1	1.67	7
5	0	5.00	6
4	0	4.00	5
3	0	3.00	4
2	0	2.00	3
1	0	1.00	2
0	0	0	1

Clearly, both presentations are equivalent, however, Rothbard's table presentation is more cumbersome and it is difficult to see the tendency in these processes. The two-dimensional map is clearer and easier to use.

A plot of the demand of both commodities as a function of the price of commodity B is presented in Figure 5.

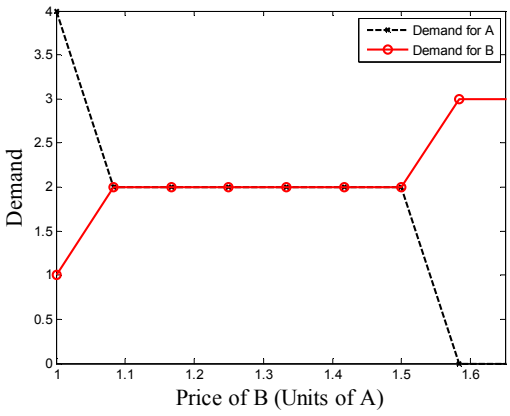

Figure 5. The demand curves of both commodities as a function of the price of commodity B.

In Figures 5 and 6 we can clearly see that the demand curve of commodity B *increases* when its price increases from 1 to 1.67. Similarly, the demand curve of commodity A decreases.

Both of these effects contradict the law of demand, and they are a clear indication of a Giffen good (B).

Clearly, this Giffen anomaly occurs only in a narrow range of price levels. When the price of B increases beyond 1.67 the demand for commodity B finally decreases as should be expected. Clearly, beyond a certain price level the population is incapable in purchasing this (by now) luxury good.

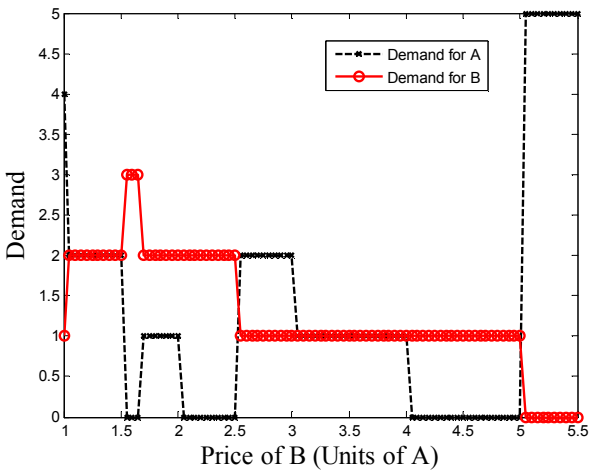

Figure 6. Same as Figure 5 but for a wider range of prices.

From this presentation it is clear that the Giffen effect occurs due to the ridge in the "south" part of the ranking map (Figure 4). That is, the matrix is clearly asymmetric. As a function of *b* the ranking is not uniform, but instead its slope at the beginning is high and then it reaches saturation very quickly, beyond which it increases much more slowly. On the other hand, the ranking function increases much more uniformly as a function of *a*. The Giffen effect requires this asymmetry.

Therefore, whenever there is a commodity, which has high value in small doses, but any further increase in its amount does not substantially increase its utility, then this good has the potential of becoming a Giffen good. That is why bread and potatoes were suggested as a Giffen good[1]. A small amount of bread can differentiate between life and death, but beyond a certain amount, i.e., when survival is guaranteed, people prefer to add other ingredients to their diets, such as proteins (meat), vitamins (fruits), and fibers (vegetables), either to improve the taste of their food or to improve their health.

Despite the similarity between the two dimensional preference schedules, which is presented here, and the two-dimensional neoclassical utility function, the distinctions should be emphasized. The analysis presented here is purely Austrian in nature: the commodities are evaluated only in discrete quantities; decision between two bundles of goods is based upon the relative ranking and not on a utility function. As a consequence, the value of a specific bundle of goods has only ordinal meaning and no indifference curves are possible since any rank value appears only once in the matrix.

5. Conclusions and Summary

It has been shown that the existence of Giffen good can have an Austrian interpretation.

Not only doesn't its existence contradict any praxeological axiom or law, in certain cases its existence can be predicted by these praxeological tools. This prediction analysis can be remain within the scope of the Austrian school of economics without the need for neoclassical tools and concepts, such as: utility functions, the continuous assumption, or indifference curves.

However, while the well-known Rothbard's value scale tables are too cumbersome to this kind of analysis, in this paper we suggest to replace them with two-dimensional value ranking matrices, which incorporate all possible bundles of commodities (the ranking matrix dimensions is equal to the number of commodities).

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