The Giffen Paradox Revisited

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Abstract

This paper aims at defending Austrian causal-realist demand theory which refutes the existence of upward-sloping demand curve or the Giffen good. The analysis traces back to the fundamental difference between Austrian and neo-classical microeconomics, especially in utility theory. Additionally, this paper also briefly examines and proposes a rejoinder to the criticism of Hudik (2011a).

1. Introduction

The comparison between neo-classical and Austrian economics has been a great constructive discussion in the economics profession. Unfortunately, for the most part, the scope of the discussion is indeed macroscopic and from a methodological ground. As Klein (2008) pointed out, what make the Austrian school distinct from the neo-classical framework, i. e. the heart of the Austrian analysis, are "price theory, capital theory, monetary theory, business-cycle theory, and the theory of interventionism." Among these topics, though there exists similarity, the dehomogenization between Austrian and neo-classical price theory deserves much more attention than what it is having now within the profession.

The most comprehensive body of Austrian price theory can be seen in Rothbard (2009 [1962]), in which Rothbard deduced the downward-sloping demand curve and upward-sloping supply curve from Austrian utility theory. Since according to Austrian methodology, the shapes of these curves are apodictically true, leaving no room for the existence of other exceptions such as the Giffen paradox that can be seen in neo-classical standard microeconomics. On the contrary, Caplan (1999) claimed that Rothbard, on the one hand, refuted the neo-classical approach on utility theory, which is a foundation for price theory, on the other hand, he accepted in an ad hoc manner the possibility of the "income effect" as well as the "substitution effect". Caplan (2001) reasonably argued that if Austrian price theory cannot be backed by a sound justification to remove this tension, the rest of Austrian price theory is wrong as it is based on fatal errors. Nevertheless, the case for Austrian price theory in the late 1990s – early 2000s were indeed unsatisfactory, either because it escaped the discussion on "income effect" and the "substitution effect" (Hulsmann, 1999), or defended the Austrian view insufficiently (Block, 1999), or tried to abandon the "income effect" altogether with the neo-classical bathwater (Salin, 1996). Recent literature has raised the controversy again, including both the critique of Rothbard (Hudik, 2011a) as well as the defense of Austrian causal-realist price theory (Klein, 2009; Salerno, 2018; Israel, 2018). While the present author agrees with most of these defenses of the Austrian framework, they still left the task unfinished as there was no explicit and complete comparison between Austrian and neo-classical analysis for the Giffen case. As Salerno (2018) has done a great work of proposing an Austrian explanation for the possibility of a backward-bending labor supply curve, this paper will serve to carry the other half of the story, the Giffen paradox. Additionally, this paper also briefly examines and proposes a rejoinder to the criticism of Hudik (2011a).

2. Neo-Classical versus Austrian utility theory

In the standard neo-classical analysis, the "total effect" of a change in price can be decomposed into the "income effect" and the "substitution effect". The Giffen case happens when the "income effect" is large enough to outweigh the "substitution effect", in which the change in quantity demanded moves in the same direction with the change in price, making a demand curve that has positive slope conceivable. Yet, there are particular characteristics of the neo-classical analysis that made this conclusion possible, which are crucially different to Austrian theory:

1. The absence of money since price is merely an exchange ratio between two goods.

2. The consumers rank different *heterogeneous bundles* of goods.

3. There is a set of points where the consumers are indifferent between two goods, i. e. the indifference curves, or more precisely, the shape of the indifference curve.

Furthermore, neo-classical microeconomics must assume a set of factors to be constant when analyzing that effect:

4. Consumers' preference.

5. Prices of all other goods.

6. Nominal money *income*.[1]

On the other hand, Austrian price theory proposed a close, but fundamentally different, set of assumptions:

i. Consumers' value scale.

ii. Prices of all other goods.

iii. The *stock* of money that individuals possess.

Since according to Austrian utility theory, indifference is not compatible to human action and cannot be used as a tool of economic analysis, and there has been a strong refutation from Austrian economists on this point already (Rothbard, 1956, 2009 [1962], pp. 307-311; Block, 1999, 2003; Hulsmann, 1999; 2000; Hoppe, 2005), this paper will focus only on the tension emerged from (1) and (2). Besides, assumptions (4) and (5) belong to the Austrian set of assumptions as well, so only (6) and (iii) make the difference between two sides of the discussion.

In Austrian utility theory, consumers do not rank different heterogeneous bundles of goods, but instead goods that are ranked in discrete and homogeneous units. For example, an individual may have a value scale as follows:

1. 50 US$.

2. The first copy of Human Action.

3. 45 US$.

4. The second copy of Human Action.

According to Rothbard:

It is evident that things are valued as means in accordance with their ability to attain ends valued as more or less urgent. *Each physical unit of a means* (direct or indirect) that enters into human action is valued separately. Thus, the actor is interested in evaluating only those units of means that enter, or that he considers will enter, into his concrete action.

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[1] Strictly speaking, this set of assumptions is Hicksian assumptions. See Friedman (1954) and Salerno (2018) for the neo-classical controversy over this set of assumptions, which includes the Friedmanite formulation of the demand curve. This paper treats the Hicksian set as the standard of neo-classical assumptions as it is widely accepted and presented in modern microeconomic textbooks.

Actors choose between, and evaluate, not "coal" or "butter" in general, but specific units of coal or butter. In choosing between acquiring cows or horses, the actor does not choose between the class of cows and the class of horses, but between specific units of them—e.g., two cows versus three horses. Each unit that enters into concrete action is graded and evaluated separately.

(Rothbard, 2009 [1962], p.21, emphasis in original)

And thus each unit of the good must be:

... interchangeable from the point of view of the actor. Thus, any concrete pound of butter was evaluated in this case perfectly equally with any other pound of butter. Cow A and cow B were valued equally by the individual, and it made no difference to him which cow he was faced with the choice of saving. Similarly, horse A was valued equally with horse B and with horse C, and the actor was not concerned which particular horse he had to choose. ... a commodity is in such a way available *in specific homogeneous units[2] equally capable of rendering the same service to the actor.*

(ibid, p.23, emphasis in original)

Nozick (1977, pp. 370-371) posed an objection that if each unit of the good is interchangeable and homogeneous, the consumer must be indifferent among those units. Thus, a rejection of the concept of indifference on the one hand and the use of homogeneous goods on the other hand leads to self-contradiction. See Block (1980, pp. 423-425) for a refutation of this criticism, that Austrian economics pays attention to indifference only in the praxeological sense, i.e. relative to the time of action, as contrary to the psychological view of Nozick. The problem raised by Nozick caused a long debate regarding the nature of indifference to be solved (see Hoppe (2005, 2009), Machaj (2007), Block (2009ab), and Hudik (2011b)), but within the scope of this paper, it should not be further addressed. However, the present author would like to add a note to clarify the confusion between utility and serviceability. While indifference means two units of goods yield the same utility, two homogeneous units of goods have the same service to the consumer. Hence, consumers still rank different units even when they are homogeneous, and this does not imply indifference. One example is the case of time-preference for durable goods. If two goods yield the same total serviceability, consumers will rank the one that is *less* durable higher on his value scale and *vice versa.* It must also be noted that two units of goods might yield the same serviceability even if they differ physically. On the other hand, if two units of goods are homogeneous, which implies they are physically the same, the consumers should have the same service yielded by these two units. The crucial difference here is that utility varies subjectively across consumers, while serviceability is an objective concept.[3]

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[2] A similar view on homogeneous units can also be found on Kirzner (2011 [1961], pp.48-67), despite the fact that Kirzner himself did not state it explicitly.

[3] Kirzner (1966) treated the serviceability of (capital) goods as being subjectively formulated by entrepreneurs, arguing that the physical consideration for the serviceability of (capital) goods is not compatible with a heterogeneous structure of capital. Klein (2007) coined the term more accurately, that it is the *attributes, i.e. "the relative productive performance of those resources".* Clearly, the concept of serviceability under the consideration of this paper is *ex ante* to the act of the economic agent, meanwhile

Therefore, any value scale that is made up of heterogeneous bundles of goods is not present in Austrian utility, for example:

1. One copy of Human Action; 50 US$
2. Two copy of Human Action; 20 US$
3. Three copy of Human Action; 5 US$

As the decomposition between the "income effect" and the "substitution effect" can be made only by applying the neo-classical analysis of heterogeneous bundles of goods, the Giffen case is impossible in the Austrian framework since it deals only with homogeneous stock of goods in discrete units (Klein, 2009)

Furthermore, in neo-classical microeconomics, with a fixed nominal income and an increase/decrease in price, real income will decrease/increase accordingly. Put it differently, the purchasing power of money will change following the change in price, causing the "income effect" that makes the Giffen case possible. Salerno (2018) argued that, from an Austrian perspective, the "income effect" is a mathematical illusion as it is deduced from two fatal flaws: first, it failed to integrate money into the analysis since money is also a commodity that is traded with other goods, and if price and marginal utility of related goods are to be held constant, the purchasing power of money must have the same property as well; second, what determines consumers' demand is the stock of money that they possess momentarily *ex ante* to exchange; however money income is an *ex post* concept, and thus has no role in the determination of price. As Salerno (2018, p.32) convincingly puts it:

> At the moment before any set of exchanges is consummated all that objectively exists are given individual stocks of goods and money. These stocks were accumulated by their owners from a series of discrete exchanges in past factor and product markets. The current marginal utilities ascribed to these goods and money balances are *completely* determined by their relative positions on individual value scales. Thus, neither money income nor real income is a direct determinant of the demand curve.

However, the present author accepts the argument of Israel (2018) that the effect of price changes on purchasing power of money is never neutral, at least to the single good under consideration, thus it is nonsense to assume the purchasing power of money to be constant:

> The purchasing power of money corresponds to the array of goods that can be exchanged against a given sum of money on the market. Hence, whenever some money price is allowed to change *ceteris paribus*, it has a direct effect on the purchasing power of money. When a money price increases along the demand curve, then the exchange value of money and hence its purchasing power decrease, and *vice versa*. If, however, the demand curve for a specific good is itself contingent on the purchasing power of money, a price change along a given demand curve is contradictory as it destroys the underlying assumption on which the demand curve is based. In other words, a price change along the demand curve affects the

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its attributes can only be realized once the resource or good is already owned and used, meaning *ex post* to the considering economic action.

demand curve itself as it changes the purchasing power of money. There could thus be no price change along the demand curve.

(Israel, 2018, pp. 380-381, emphasis in original)

Therefore, there exists a possibility for a "wealth effect" that is equivalent to the "income effect" in neo-classical doctrine. When price of a good decreases, given a fixed purchased quantity, consumers will have more money on their cash balance, i. e. they become richer, and vice versa. What matters is what consumers will do with this change in cash balance. They can either make no change to their cash balance, or to "substitute" this increase by purchasing more the good under consideration, or to "substitute" by buying other goods. Hence, instead of assuming the fixed purchasing power of money, the alternative is to fix the purchasing power of money relatively to other goods, or in other words, the opportunity cost of spending money on other goods (Israel, 2018)[4].

3. "Giffen goods" in Austrian price theory

The set of factors that Austrian causal-realist price theory can reasonably assume to be fixed, therefore, must be:

i. Consumers' value scale

ii. Prices of all other goods

iii. The stock of money that individuals possess.

iv. *Opportunity cost* of spending money on other goods.

This set of assumptions will facilitate us to formulate an explanation for the Giffen paradox strictly based on Austrian ordinal preferences.

Since Salerno (2018) treats the neo-classical income effect as a mathematical illusion, the effect due to a change in price is purely a substitution effect. Yet, as it can be seen from the discussion above, the so-called wealth effect still exists. However, our assumption already restricted the opportunity cost of spending money on other goods to be constant, the wealth effect exists only with the good under consideration. The effect on other goods is thus can be analyzed by substitution effect, as all goods are partial substitution for others:

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[4] The opportunity cost of spending money on other goods might be misunderstood as the marginal rate of substitution between money and other goods. However, contrary to the marginal rate of substitution, opportunity cost in Austrian literature is ordinal and subjective, and thus cannot be quantified into a value. Newman (2018, p.12) clearly explained:

The opportunity cost of any action, then, is the value of the highest-ranked end forgone because of the action. As such, the opportunity cost concept is inseparable from the concepts of value and action. The ordinality and subjectivity of preferences applies to both value and cost. Just as value is appraised in action ex ante, so are costs.

For further discussion on the controversy over opportunity cost, see Newman (2018).

All consumers' goods are, on the other hand, *partial* substitutes for one another. When a man ranks in his value scale the myriad of goods available and balances the diminishing utilities of each, he is treating them all as partial substitutes for one another. A change in ranking for one good by necessity changes the rankings of all the other goods, since all the rankings are ordinal and relative.

(Rothbard, 2009 [1962], p.282, emphasis in original)

This conclusion of Rothbard deserves further clarification. Consider a fixed value scale, a change in ranking for one good does not necessarily change the rankings of all the other goods. For example, we might have a value scale A, B, C, D. When D is ranked higher than C, it does not necessarily rank higher than A and B, keeping the ranks of A and B on the value scale unchanged. However, all goods have diminishing marginal utility, and all goods are ranked with *different units of money.* Since different units of money are present everywhere on the value scale, and a change in marginal utility of one good generates the change in marginal utility of money, *different units of money,* the ranks of all others must change following a change in ranking of any other good. Praxeologically, when one good is traded against money, its marginal utility decreases along with an increase in marginal utility of money. But since money is ranked with other goods, when the marginal utility of money changes, ranking of the others must change accordingly. It must be noted that neo-classical microeconomics fails to realize this "substitution effect" since it does not integrate the existence of money into its framework, thus defined substitution goods by a mechanistic relationship as a positive correlation between the change in price of one good and the demand for other goods.

Consider a change in price on the inelastic segment of the demand curve for a good A. When price of A increases, the money stock spent on A will increase as well as it is a movement on the inelastic segment. Equivalently, the total money stock available to be spent on other goods decreases, hence raises the marginal utility of money against other goods. However, in the Austrian framework, other goods are also traded against money, thus the increase in marginal utility of money causes the demand curve of other goods to shift to the left. In this case, both the quantity demanded and the price of other goods decrease, as can be seen in Figure 1.

The opposite effect holds true for the elastic segment of the demand curve for A. On this segment, an increase in price of A corresponds to a decrease in total money stock spent on A, leaving higher amount of money stock that can be spent on other goods. In other words, the marginal utility of money against other goods decreases, shifting the demand curve of these goods to the right, which can be seen in Figure 2. The same principle can be applied to explain the effect when price decreases along the demand curve. Yet, though Rothbard (2009 [1962], pp. 280-288) did analyze this interrelation of consumer goods in details, he failed to recognize, or at least did not specify, the fact that the Giffen phenomenon is simply due to this substitution effect. For now, it is reasonable to conclude that in causal-realist price theory, there is no such thing as the Giffen paradox or upward-sloping demand curve, but it is indeed a shift in the demand curve for goods.
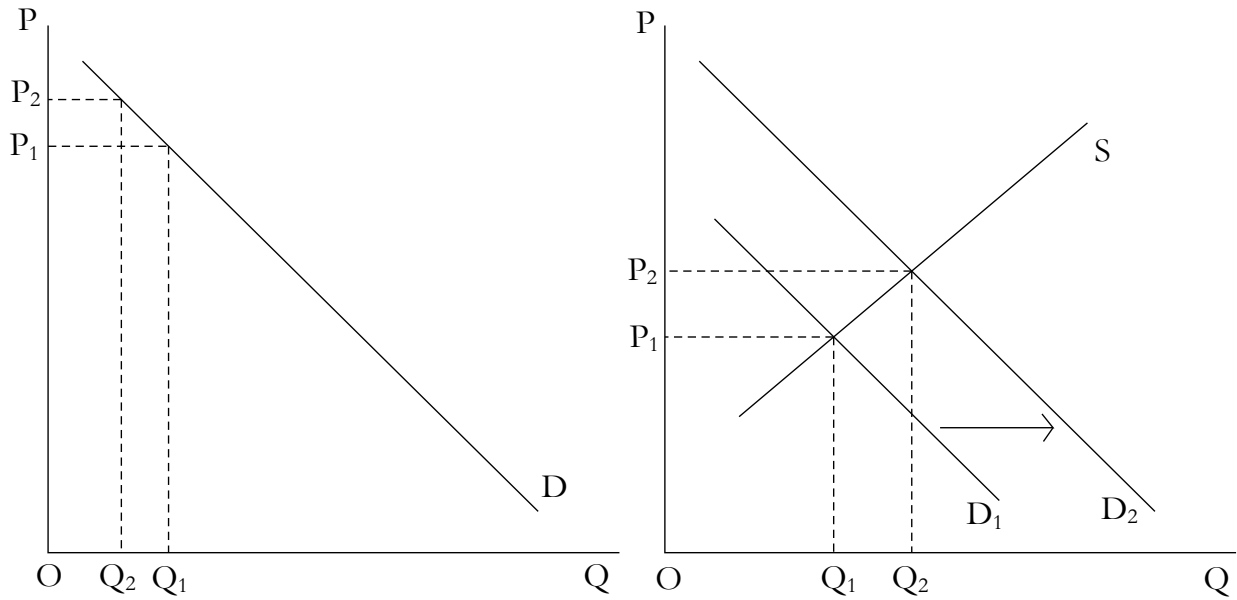
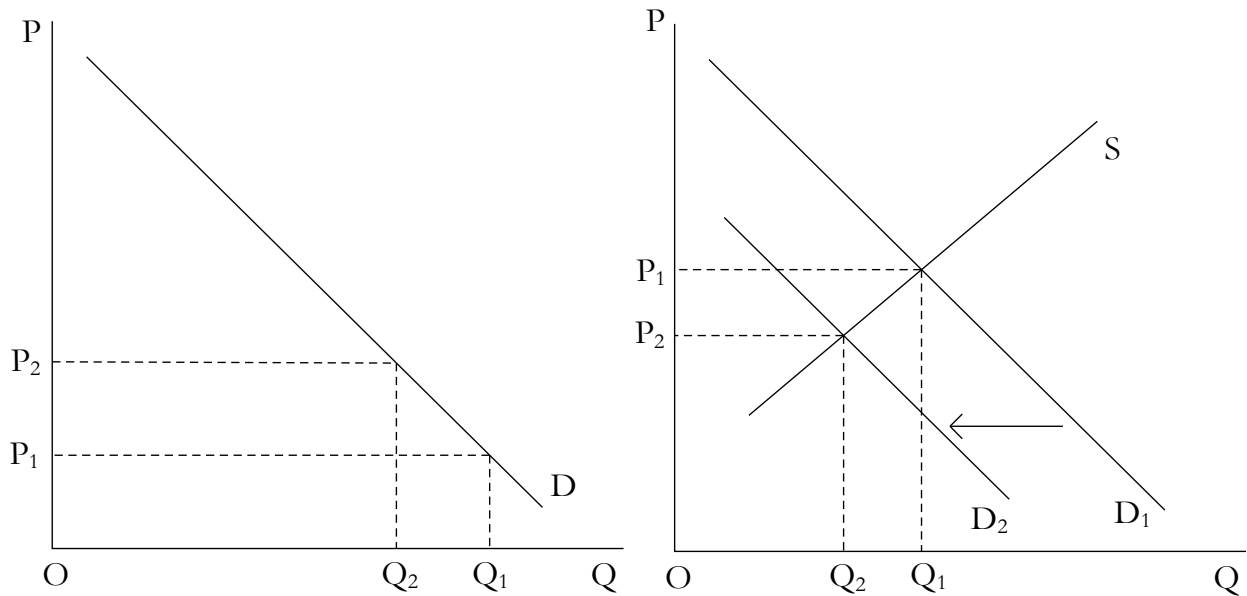**Figure 1: Price change in the elastic segment of the demand curve.**

Figure 2: Price change in the inelastic segment of the demand curve.

4. Criticism

One criticism of causal-realist analysis for the Giffen case can be found in Hudik (2011), in which he proposed a possible scenario of Giffen behavior derived from the law of diminishing utility. First, Hudik assume an individual value scale as follows:

1. Cake A, which can be produced only with two eggs.
2. Salad X, which can be produced only with four tomatoes.
3. Cake B, which can be produced only with three eggs.

4. Salad Y, which can be produced only with four tomatoes.

5. Cake C, which can be produced only with one egg.

6. Salad Z, which can be produced only with four tomatoes.

In order to satisfy these ends, the consumer can use different bundles of egg and tomato. Being endowed with 6 tomatoes initially, at prices of one tomato for one egg and two tomatoes for one egg respectively, feasible bundles thus are represented in Figure 3, which corresponds to the demand curve in Figure 4, in which has an upward-sloping segment when moving from p=1 to p=2.

Though the aim of Hudik was to derive "Giffen behaviour from the preference ordering defined on the set of ends rather than bundles of goods", i. e. showing a possibility for Giffen goods using the law of minishing marginal utility for discrete units of goods as in Austrian theory, the problem of Hudik was that he fell on the neo-classical trap that he initially tried to avoid. There are shortcomings that need to be addressed, by which the present author argues that his critique of Austrian demand theory as well as his argument for the possibility of Giffen behaviour are not sufficient.

p=1 (one egg = one tomato)		p=2 (one egg = two tomatoes)	
Bundles	Ends satisfied	Bundles	Ends satisfied
(0,6)	2nd (X)	(0, 6)	2nd (X)
(1,5)	2nd, 5th (X, C)	(1, 4)	2nd, 5th (X, C)
(2,4)	1st, 2nd (A, X)	(2, 2)	1st (A)
(3,3)	1st, 5th (A, C)	(3, 0)	1st, 5th (A, C)
(4,2)	1st, 5th (A, C)		
(5,1)	1st, 3rd (A, B)		
(6,0)	1st, 3rd, 5th (A, B, C)		

Figure 3: Feasible bundles for egg and tomato at p=1 and p=2
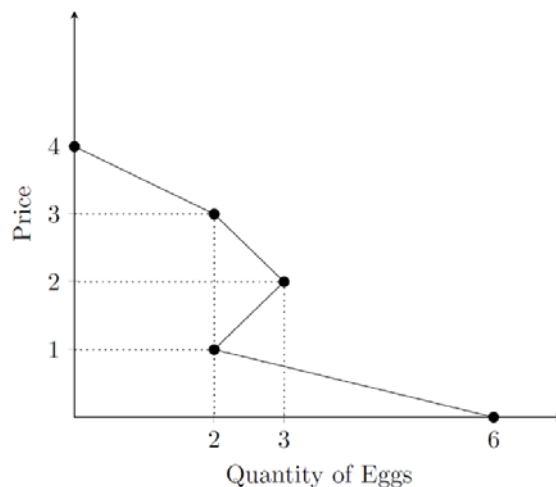**(Hudik, 2011a, pp. 314-315)**

Figure 4: Corrensponding demand curve for egg

First, no money is found in his value scale. In Austrian framework, money is a good that is evaluated with other goods, and thus each unit of money has its own marginal utility and is ranked on the value scale of the consumers. On the other hand, money presents in the neoclassical doctrine in the form of a budget constraint. In order to apply the law of diminishing marginal utility to derive the shape of the demand curve in either of these frameworks, money must present. Therefore, since the value scale given by Hudik is incomplete, it is even impossible to derive the shape of the demand curve, let alone the upward-sloping case.

Second, even if we assume that tomatoes here can be treated as money, and as the consumer is endowed with 6 tomatoes, meaning the budget constraint is m=6, this example still does not suffice. Money must be ranked and traded against other goods at the margin, which in turn implies that different units of money have different marginal utility. Money is thus not an independent determination as in the case of the budget constraint, which implicitly assumed the neutrality of money.

Finally, there are different value scale of bundles used by Hudik at different prices, as well as the initial scale for discrete units of cake and salad. However, the Austrian consumers evaluated each unit of goods given only one value scale, and hence the choice on one scale does not have any implication on the others. As it can be seen in Figure 3, following Hudik's line of argument, bundles (2, 4) and (6, 0) are equally likely to be chosen, but we cannot know with absolute certainty, and indeed Hudik himself was totally aware of this point: "since the consumer's ranking does not give us the answer, whether satisfying the second end is more important than simultaneously satisfying of the third and fifth ends, it is possible that the consumer will choose bundle (2, 4)." What if the bundle (1, 5) ranks higher than both (2, 4) and (6, 0)? Why not? Furthermore, though the initial value scale is applied for discrete and homogeneous unit of goods, the scales at different prices are indeed for bundles of goods. Nevertheless, in the Austrian framework, bundles cannot be ranked. In causal-realist utility theory, value scale for bundles cannot apply, since the value scale of individuals must be in discrete units of homogeneous goods.

5. Conclusion

This paper presented a refutation for the existence of the Giffen good from an Austrian, causal-realist point of view by tracing back to the fundamental difference between Austrian and neo-classical microeconomics, especially in utility theory. What can be concluded is that, contrary to the neo-classical doctrine, what might be called "the Giffen phenomenon" does not represent an upward-sloping demand curve, but instead a shift in demand curve due to the substitution effect. The juxtaposition of Austrian on the one side and neo-classical microeconomics on the other side serves to reveal the shortcoming of neo-classical standard microeconomic theory, as well as proving the Austrian framework to be sound and appropriate. However, by doing so, this paper also reinforces the view of Klein (2008) and Salerno (2011) that Austrian microeconomics is not simply a verbal expression of neo-classical theory. On the contrary, it is totally a different, unique, and distinct body of analysis that seeks to explain the formation of real-life prices observed every day in the market, in which its neo-classical counterpart fails to propose an adequate explanation.

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