Teaching and Educational Methods

A Brief History of Giffen Behavior and an Applicable Student Example

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Abstract
Giffen behavior is covered in various intermediate microeconomics textbooks, but debates arise over its existence. Given particular assumptions, Giffen behavior arises for students waiting until the end of the term to study. For some students, the available time for studying diminishes, but non-academic pursuits are available after the term (the time constraint becomes steeper). While the total possible time for the course decreases, some students study more. Instructors may demonstrate this type of example to students in hopes that it will be more relatable and gain a greater knowledge of the Giffen good concept.

1 Introduction/Background

A fundamental topic taught in an intermediate microeconomics course is consumer theory. One addendum to this topic is the concept of the Giffen good, introduced and named by Marshall in his third edition of *Principles of Economics* (Dooley 1985). A Giffen good is defined as a good which, when the own price of a good increases, the quantity demand for that good increases. Currently, most intermediate microeconomic textbooks discuss Giffen goods, but the perceptions of the concept vary by author. Varian (2009) and Mansfield and Yohe (2003) explain the theory of Giffen goods but do not give any examples. Perloff (2020) presents a hypothetical situation for a Giffen good to exist (consumer chooses between going to basketball games and watching movies). Another intermediate microeconomics textbook uses a hypothetical situation, but notes that "Though intriguing, the Giffen good is rarely of practical interest because it requires a large negative income effect" (Pindyck and Rubinfeld 2018, p. 122). Landsburg (2014) cites an example wherein a Giffen good exists in an experimental setting, but he states that it can never exist in the real world. A well-known example of a Giffen good, potatoes during the Irish potato famine of the mid-1800s, is discussed and discredited by both Frank (2021) and Goolsbee, Levitt, and Syverson (2020). However, Goolsbee et al. (2020) mention a study by Jensen and Miller (2008) that demonstrates that rice was a Giffen good for particular households in rural areas of China's Hunan province.

A common misconception is that Sir Robert Giffen is attributed to alleging that potatoes during the Irish potato famine were Giffen goods (Stigler 1947; McDonough and Eisenhauer 1995). When Giffen proposed the idea that quantity demand may increase when price increases, he actually used the example of bread (Stigler 1947). Stigler (1947) analyzed the per capita consumption and price of wheat in the UK from 1889 to 1904. Based on the data from the relevant years, bread did not exhibit Giffen behavior during this time. Rosen (1999) examines the potato market during the famine and refutes that Giffen behavior existed at that time. However, in Cork, Ireland, from 1846 to 1849, consumers of bacon pigs exhibited Giffen behavior (Read 2017). Read (2017) explains that when the price of bacon pigs increased, the quantity purchased increased because the pricier substitute good (beef) was also rising, while consumers wanted to maintain their current standard of living.

Although research has demonstrated that potatoes and bread are not Giffen goods, other studies identify the Giffen behavior does exist. Services, such as insurance (Hoy and Robson 1981; Briys, Dionne,

and Eeckhoudt 1989; and Hau 2008) and the family service industry in Beijing (Zheng et al. 2016), have been identified as Giffen goods. Kerosene consumption exhibits Giffen behavior for both the United States (Bopp 1983) and in Nigeria (Arawomo 2019). In an experimental setting, Battalio, Kagel, and Kogut (1991) demonstrate that quinine is a Giffen good for "poor" rats. Some researchers have discovered that Giffen behavior exists for consumers that are experiencing subsistence consumption. Rice consumption in rural parts of Bangladesh exhibits Giffen behavior (Lekhe et al. 2014). Jensen and Miller (2008) demonstrate that rice and wheat are Giffen goods for the "poor-but-not-too-poor" in particular parts of China. Another example of subsistence consumption exhibiting Giffen behavior is Russian consumers switching from less affordable meat and fish (prices of these goods decreased) to potatoes and bread (prices of these goods increased during the early 1990s; Shachmurove and Szyrmer 2011). Some students learning about Giffen goods may relate to any of these examples. However, it is possible that some students will not be able to relate to any of the examples in the literature.

This commentary is to demonstrate an example of Giffen behavior that exists in academic learning. Since the example deals with academic learning, students learning about Giffen goods may relate easier to this example and gain a greater knowledge of the principle. The amount of time a student must study for a course may diminish throughout the term. Many students that have not performed well over the term will devote more of their time toward the course at the end of the term. That is, since the time a student can spend on the course diminishes as the term progresses, given other concurrent commitments, the fear of passing or getting a desired grade in the course tends to increase toward the end of the term. In addition, for some students the fear of missing out by not engaging in non-academic pursuits does not increase since those activities may be consumed after the final exam. Thus, when the student starts to increase the time spent studying at the end of the term, the study time "consumed" exhibits Giffen behavior.

2 Student Behavior

Students have many various activities that they may spend their time doing. There are activities that will always be available to the student (e.g., playing video games, watching movies, watching sports games, surfing the internet, and spending time with family/friends). As some of these activities become more defined, they become only available during the duration of the semester (i.e., watching a certain movie in the theater, watching or attending a particular sporting event, and attending a grandmother's funeral). Additionally, if a student is starting a job at the end of the semester, they will start to devote more time to other activities since they are aware their time will be more constrained after the end of the semester. This paper will compare the time the student has for learning in one class with activities that are not limited (accessible activities) and are not restricted to other post-term commitments, as those mentioned previously.

Most students know that learning exam material throughout the term is requisite to receive a good grade in a course. The information can be learned utilizing two different approaches. The first approach is to attend classes, whether this means to attend all or some of the classes. The other approach is to go over the exam material outside of the classroom using class notes, the course textbook, online resources, etc. From the perspective of most teachers, students should be utilizing both approaches. Applying both or either of these approaches demonstrates that the student is spending time on the course. Although the student is learning the material throughout the term, the student will reconsider whether the current amount of time spent learning will be enough to receive the desired grade or if more time is required.

Each student has a finite amount of life; therefore, they have a time constraint. As the student progresses through the term, the quantity of available time to study decreases, and as a result, the time (budget) constraint for a given period of time (e.g., the amount of time left in the term) for studying approaches zero. Students likely believe that they will be living many more years. Students without post-

term commitments may consume accessible activities after the term, and their expected lifetime after the term is much larger than the time of the term. Thus, it is assumed that the total possible quantity of time engaging in other accessible activities does not change or remains relatively constant throughout the term. The price for the time constraint is fear. A student may feel fear that they are missing out when they do not engage in the accessible activity. Many students experience an increased amount of fear when the realization sets in that there is a limited amount of time left in a course for studying and related activities, especially if the final exam is cumulative.

3 Procrastination

Students waiting until the end of the term to study are procrastinating. Studies have identified procrastination as a negative characteristic of individuals (Akerlof 1991; O'Donoghue and Rabin 2001). Procrastinators demonstrate time-inconsistent behavior and do not necessarily maximize utility overtime, especially if the task that is required does not get accomplished. However, studies have identified that there are diverse types of procrastinators, and not all procrastinators exhibit Giffen behavior.

Multiple tests exist that measure motives for various types of procrastinators (Ferrari 1992). Given the tests, Ferrari (1992) classifies procrastinators as avoidant or arousal. Other studies define avoidant as passive and arousal as active procrastination (Cao 2012; Seo 2012). The avoidant procrastinator does not want to complete a task and will fill their schedule with other tasks until the project needs to be completed. According to Ferrari (1992), the avoidant procrastinators put off to protect their self-esteem or are afraid of failure. On the other hand, the active procrastinator delays the task to receive a "thrill" from working against a deadline. The active procrastinator feels that they work better under pressure. Cao (2012) proposes that for students to be successful in college they must turn from being a passive (or avoidant) procrastinator to an active procrastinator. Seo (2012) finds that active procrastinators reach a higher level of academic achievement than passive procrastinators. Thus, when the active procrastinator puts off studying until the end of the term, it is likely that their utility will increase.

An increase in utility from procrastinating for active procrastinators suggests that study time is not exhibiting Giffen behavior for these individuals. Thus, the only type of student that exhibits Giffen behavior when studying is the passive procrastinator. In addition to protecting self-esteem and fearing failure (Ferrari 1992), the student may put off studying because they can engage in other activities. The student is hoping that they can learn the material and pass the course at the end of the term while their fear (price) of not obtaining their desired grade is increasing.

4 Teaching Demonstration

Typically, an instructor teaching about utility maximization will draw an indifference curve and a budget constraint with the variable x labeled on the horizontal axis and y labeled on the vertical axis. The variables x and y are usually represented as two goods. However, the model may be expanded to measure students' time. The average amount of time spent studying is denoted on the horizontal axis and the average amount of time spent doing other accessible activities is denoted on the vertical axis. If both axes are scaled the same, this results in a steep curve because the average time a student may spend studying in a lifetime for a particular class is a small fraction of their lifetime. Since most people do not spend most their life as a student the vertical axis has been scaled to reflect a utility maximization problem as shown in Figure 1.

As the term progresses, the total time spent studying for a particular course diminishes, and thus the budget constraint becomes steeper. However, it is possible that at the beginning of the term a student decides not to spend much time studying for the course. To pass the course, the amount of time dedicated to studying for the course needs to increase. The time constraint gets steeper since the fear of

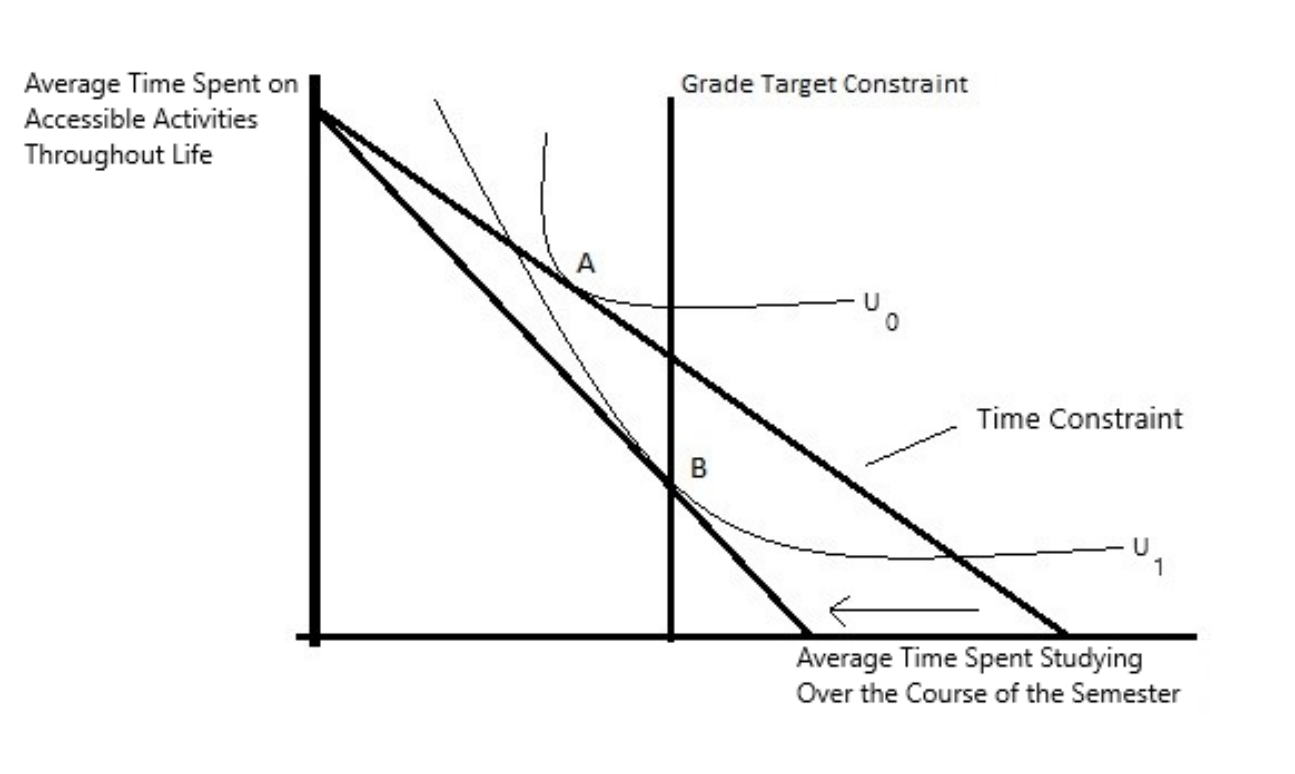

Figure 1: Effect of Time for Student Delaying Studies

passing the course is greater than the fear of not engaging in other activities. A student will then study more (increasing the average amount of time studying), although the time constraint is getting steeper. Given the student is a passive procrastinator, their level of utility goes down (they are on a lower indifference curve). The passive procrastinator student type that demonstrates this type of behavior is treating studying as a Giffen good.

It is possible that students may get confused between a Giffen good and Giffen behavior. Traditional economic theory suggests that a Giffen good exists when consumers buy more of a good when the price increases, ceteris paribus. Giffen behavior exists when the price of a good increases, but is due to another constraint. Many examples in the literature have demonstrated the existence of Giffen behavior, given that the consumer is subject to at least one other constraint. Creedy (1990) solves Marshall's transportation problem in general from utilizing two constraints. The hypothetical traveler would prefer to travel by train rather than boat since it is quicker. When the price of boat travel increases, the traveler will travel farther by boat due to both the budget and distance constraints. Adding a subsistence constraint to the budget constraint demonstrates Giffen behavior for potatoes (Gilley and Karels 1991; Davies 1994; Shachmurove and Szyrmer 2011), bread (Shachmurove and Szyrmer 2011), and rice (Jensen and Miller 2008).

In the model for studying, the student is constrained by time and what Allgood (2001) calls the grade target constraint (see Figure 1). A student will exert as little effect as possible to receive the highest grade or their target, or in some cases the minimal effort, to pass the course. Since study time is compared to all other accessible activities, the grade target constraint, which represents the minimum average amount of time required to reach an individual's grade target, is a straight line and perpendicular to the time spent studying axis. Unlike the budget constraint, to satisfy the students' grade target, study time must be at or above the constraint.

Students who study hard all term are beyond the grade target constraint. As the term progresses, the diligent student exceeds the grade target constraint and thus the average study time will decrease

closer to finals week. Studying becomes a normal good for this type of behavior. Students who put off studying are not reaching the grade target constraint. Not all students who realize that more time studying is required will make the final push toward the end of the term. The type of student who simply gives up treats study time as a normal good.

As shown in Figure 1, students may exhibit Giffen behavior for studying. However, study time might be an inferior good. The type of good will depend on the students' outcome. Students that intend to study but do not meet the constraint treat study time and related activities as inferior behavior. If students study strong at the end of the term when the price (fear) is increasing, the grade target constraint is satisfied.

In consumer theory, a price change leads to two effects, namely the substitution and the income effect. As the price for learning increases, the substitution effect is negative. Given more time, students who engage in a conscientious effort to comprehend the exam material throughout the term study less because they have already invested much time into the class. Students that do not put in an adequate amount of time learning the exam material throughout the term do not spend additional time studying if it was given to them throughout the semester. The income effect will also be negative. The students who persist with the subject matter throughout the term know their time (income) will decrease through the term and plan accordingly so that they will not have to cram at the end. Although the time that can be devoted to the subject is diminishing, students may not devote more time of their own free will. Based on the conditions mentioned above, study time is a normal good for both types of students. However, as one walks around the campus dorms at night during finals week, one will see that many students are desperately learning the exam material for the final exam. From Figure 1, the time constraint becomes steeper toward the end of the semester, but the students increase their time studying, resulting in the average amount of time studying to also increase. Since the grade target constraint is satisfied, study time for this type of student is exhibiting Giffen behavior.

Students that realize they are not attaining the grade target constraint and therefore increasing the time spent on learning may do so to maintain their current monetary income. For instance, the student will lose their scholarship, financial aid, and/or financial contributions from their parents. Even students who are not receiving financial assistance and who put off learning will converge to the grade target constraint because they will want to stay in school, since it is highly probable that their lifetime income will decrease if they get dismissed. If understood by the student, not only does the problem help explain the economic theory of Giffen behavior, but it also helps understand the dynamics of studying. Since students may be aware of other students putting off studying, they will easily relate to the problem.

For students that treat studying as Giffen behavior, the amount of time out of their budget spent studying is modest until the end of the term. As mentioned earlier, the student that devotes a large amount of time throughout the term is not likely to study hard until the end of the term. Jensen and Miller (2008) suggest that Giffen behavior is more likely to occur when the consumer is already spending a large portion of their income on the Giffen good. However, in this case the student has not consumed much (little time spent studying) until the end of the term.

5 Conclusions

Students faced with a time constraint may focus on other activities until the end of the term. Once the time that can be spent on studying diminishes, the student will need to spend more time in their studies to obtain their desired grade. The average amount of time dedicated to studying over the semester increases. Since the student is spending more time learning with less time available, students may exhibit Giffen behavior when studying for the final exam. However, this is not true for all students that put off their studies. Students that are active procrastinators will put off their studies to increase their utility level and have greater enjoyment than if they spaced out their time.

This commentary does not address whether procrastinators are passive or active procrastinators. Further research could identify whether students are more likely to be passive or active procrastinators. If most of the students do not exhibit a particular procrastination type, then what student characteristics are more likely to be passive procrastinators? Another issue to be addressed is that many students are not in college for the opportunity to learn. For these types of students, they view college as a steppingstone for a job. They do not understand that they are learning tools that will help aid them in their chosen profession. Once a student understands the benefits of college (other than a degree), their time spent will change. However, if the student knows they can receive a good grade with minimal effort, this creates an incentive to exhibit Giffen behavior in the future, as well as in their career.

Many students may find it difficult to comprehend Giffen behavior or misinterpret the principle. Identifying studying for the final exam as exhibiting Giffen behavior helps the student understand the exam material better because it is something the student can relate to. Students may also think about their study habits and find a different approach that allows more success for future courses.

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