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THE NOMENCLATURE ASSUMPTION IN DEMAND THEORY

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The Nomenclature Assumption in Demand Theory

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Abstract: This article examines the role of the nomenclature assumption in demand theory, defined as the assumption that the choice set available to economic agents is considered as given, without requiring an explanation of its origin. After reviewing existing definitions of this assumption, this article analyzes its application in two approaches to demand theory: the goods are goods approach and the characteristics approach. It also presents Yoram Barzel's analysis of the costs involved in measuring the characteristics of commodities, which highlights the implications of mobilizing the nomenclature assumption within the goods are goods approach.

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In demand theory, a distinction exists between the “characteristics” approach and the “goods are goods” approach (Gradoz 2024b). The characteristics approach describes commodities by the values of their characteristics, such as weight, color, or volume. The goods are goods approach refers to situations where this is not the case. In the goods are goods approach, the consumer’s choice set corresponds to a nomenclature of commodities, such as apples and pears, and the consumer selects the quantities of apples and pears that maximizes her utility function under various constraints. What criterion is used to differentiate apples from pears in the consumer’s choice set? Most of the time, this question remains unanswered due to the adoption of the *nomenclature assumption*. Through this assumption, the choice set available to economic agents is considered as given, without requiring an explanation of its origin. The existence of commodities such as apples and pears is therefore assumed without questioning why the choice set is limited to these commodities, how the units of measurement are defined, or why apples are distinguished from pears. In other words, the choice set is assumed rather than explained.

The characteristics approach is typically associated with the work of Kelvin John Lancaster (1966; 1971), although earlier studies had already proposed this approach (Gradoz 2024c). Notably, the Hotelling model (1929) can be considered part of this approach, as commodities are described by their location along a linear city. In this model, firms choose their location, so the nomenclature of commodities is determined at the model’s equilibrium (and not considered as given)—or is indeterminate if no equilibrium exists (d’Aspremont, Gabszewicz, and Thisse 1979). Can we then affirm that the characteristics approach abandons the nomenclature assumption? The answer is no. On the one hand, in some models of the characteristics approach, firms do not choose the values of the characteristics of their commodity, so the nomenclature of commodities remains considered as given. The only difference

from the goods are goods approach is that commodities are described by the values of their characteristics. On the other hand, even when firms choose the values of the characteristics of their commodity, as in the Hotelling model, there is still no explanation for why the choice set available to economic agents is limited to location. Similarly, in multidimensional models of the characteristics approach, such as Kelvin John Lancaster's model, we merely assume a nomenclature of m characteristics, upon which economic agents base their decisions, without explaining how this nomenclature is derived. Therefore, the characteristics approach also relies on the nomenclature assumption, applying it to the nomenclature of characteristics.

The use of this assumption in demand theory, particularly within the goods are goods approach, has significant implications (Eymard-Duvernay 2013, 146). This can be demonstrated in various ways. Notably, we could draw on the *economics of conventions*, which has given an important role to this assumption (Orléan 2003; 2015; Eymard-Duvernay 1989; 2013). However, presenting the economics of conventions and its contributions would be too long. Instead, we focus on Yoram Barzel's (1982) analysis of the costs involved in measuring the characteristics of commodities. He shows that the description of commodities depends on their expected selling price. For instance, since diamonds are expected to sell at high prices, they are meticulously measured in all dimensions, resulting in numerous types of diamonds being distinguished in the nomenclature of commodities—something that does not occur with oranges, because the cost of such detailed description cannot be compensated by their expected selling price. To put it differently, the nomenclature of commodities is an aspect of economic equilibrium: the price of commodities has an influence on the nomenclature of commodities, and the nomenclature of commodities has an influence on the price of commodities. Therefore, an implication of employing the nomenclature assumption in the goods are goods approach is overlooking an aspect of economic equilibrium, as this assumption allows to ignore the process by which the choice set available to economic agents is derived—an issue rarely addressed in this approach.

Although several studies have examined the nomenclature assumption (Benetti and Cartelier 1980; Eymard-Duvernay 1989; 2013; Orléan 2003; 2014), which we will review, no research has specifically analyzed the relationship between the use of this assumption and the role assigned to the characteristics of commodities in demand theory. This is precisely the aim of this article. The first section defines the nomenclature assumption, presents the relevant literature associated with this assumption, and examines its use in the goods are goods approach to demand theory. The second section focuses on the use of this assumption in the characteristics approach. Finally, the third section discusses the implications of using this assumption in the goods are goods approach, drawing on Yoram Barzel's analysis of the costs involved in measuring the characteristics of commodities.

1 The Nomenclature Assumption in the Goods are Goods Approach to Demand Theory

Most models adhering to the goods are goods approach to demand theory begin similarly. They assume the existence of a nomenclature comprising l distinct commodities, where x_i represents a (positive) quantity of commodity i ($i \in \{1, \dots, l\}$). The consumer's utility function is denoted $U(x_1, \dots, x_l)$. The consumer maximizes this utility function under various constraints, particularly the budget constraint. A substantial amount of time is typically devoted to detailing assumptions about consumer behavior, the structure of information, and the institutional framework within which exchanges occur. However, the foundations of the choice set available to economic agents are rarely addressed. Why is the nomenclature composed of l commodities? What criteria distinguish a commodity from a non-commodity? How is the unit of measurement for these commodities defined? What differentiates one commodity from another? The nomenclature assumption, as defined in this article, refers to the assumption that allows these questions to remain unanswered. Through this assumption, the choice set available to economic agents is considered as given,

without requiring an explanation of its origin. Consequently, in the goods are goods approach, where the choice set corresponds to a nomenclature of commodities, there is no need to explain the origin of this nomenclature. It is treated as a postulate of the model (Callon, Méadel, and Rabeharisoa 2000, 214; Orléan 2015, 95).

This assumption is often associated with Carlo Benetti and Jean Cartelier's book *Merchants, Wage Labor, and Capitalists* [original French title: *Marchands, salariat et capitalistes*] (1980). In fact, most works dedicated to the nomenclature assumption have been written in French. This article therefore offers an opportunity to introduce these works to a non-French-speaking audience. In their book, Carlo Benetti and Jean Cartelier identify several issues they believe economic theory faces (1980, 8). They present their book as an attempt to circumvent these issues. Among them, they identify "the nomenclature assumption" which is considered the "starting point of the economic theory of value" (*ibid.*, 49).¹ This assumption occupies a central role in their analysis, and their objective is to "describe economic relations without relying on this assumption, which is the source of many difficulties and ambiguities in political economy" (*ibid.*, 19).² Several definitions of this assumption are proposed throughout the book. Notably, in the section dedicated to this assumption, they write:

The nomenclature assumption is equivalent to assume the possibility of describing a set of things, referred to as goods or commodities, prior to any proposition related to society. In other words, specific social forms (exchange, production...) are built upon a neutral substrate: nature or the physical world which is assumed first (1980, 94).³

¹ "Le point de départ de la théorie économique de la valeur."

² "décrire les relations économiques en dehors de cette hypothèse, qui est à l'origine de nombreuses difficultés et ambiguïtés en économie politique."

³ "L'hypothèse de nomenclature revient à supposer possible une description d'un ensemble de choses, qualifiées de biens ou de marchandises, antérieurement à toute proposition relative à la société. En d'autres termes, les formes sociales spécifiques (échange, production...) s'édifient sur un substrat neutre : la nature ou le monde physique dont il est possible de parler en premier lieu."

Elsewhere in the book, Carlo Benetti and Jean Cartelier define the nomenclature assumption as an assumption “such that a collection of physically defined objects (therefore identifiable a priori) distributed among the elements of society is considered as given” (*ibid.*, 12)⁴ or as an assumption “by which it is assumed that objects are identifiable a priori, outside of and prior to any economic procedure” (*ibid.*, 89).⁵ They further characterize the nomenclature assumption as corresponding to the combination of three criteria: “the qualitative description of goods and services, their quantification, and the social objectivity attributed to them” (*ibid.*, 98).⁶ These three criteria are illustrated through Gérard Debreu’s *The Theory of Value* (1959). The qualitative description of goods and services implies that “all units of the same commodity are indistinguishable from one another” (*ibid.*, 99).⁷ This corresponds to the use of the *identity criterion* to differentiate commodities (Gradoz 2024a). This criterion asserts that units of the same commodity are identical and, therefore, indistinguishable. However, this criterion is unnecessarily restrictive compared to the definitions of the nomenclature assumption proposed by Carlo Benetti and Jean Cartelier. The *interchangeability criterion*, which is less restrictive and asserts that all units of the same commodity are interchangeable (but not necessarily indistinguishable), is compatible with these definitions. It is therefore unclear why they use the identity criterion to define the nomenclature assumption. Quantification, as defined by Carlo Benetti and Jean Cartelier, means that “the quantity of a commodity is expressed by a number of physical units” (*ibid.*, 99).⁸ This corresponds to the measurability assumption, which is a standard assumption in demand theory (e.g., Georgescu-Roegen 1965). Finally, the social objectivity attributed to them:

⁴ “selon laquelle est prise comme donnée une collection d’objets physiquement définis (de ce fait, repérables a priori) distribués entre les éléments de la société.”

⁵ “par laquelle il est postulé que les objets sont identifiables a priori en dehors et antérieurement à toute procédure économique.”

⁶ “la description qualitative des biens et services, leur quantification et l’objectivité sociale qui leur est attribuée.”

⁷ “toutes les unités de la même marchandise sont indistinguables les unes des autres.”

⁸ “la quantité d’une marchandise s’exprime par un nombre d’unités physiques.”

means that the *a priori* identification of commodities obtained through the procedure described above must not only be possible for the general equilibrium theorist but, more importantly, it is implicitly assumed to be known and accepted by the economic agents, who must be able to distinguish one commodity from another. This condition is crucial because if the definition of commodities according to the nomenclature assumption was not simultaneously *common knowledge* among the economic agents, it would be ineffective: one only needs to imagine the disastrous consequences for the analysis of exchange and the difficulties for the auctioneer if the economic agents did not all understand the same thing by “No. 2 Red Winter Wheat.” The reason for the resulting drawbacks is obvious: without the assumption of the social objectivity of commodities, the very *concept* of relative price would be meaningless (*ibid.*, 100).⁹

Social objectivity corresponds to a specific formulation of the *common knowledge* assumption, which has extensively been discussed in game theory (e.g., Geanakoplos 1994; Ménager 2023). However, the way Carlo Benetti and Jean Cartelier formulate this assumption is ambiguous. For instance, what do they mean by “difficulties for the auctioneer” and “understand the same thing”? Furthermore, as with the qualitative description of goods and services, this criterion is unnecessarily restrictive compared to the definitions of the nomenclature assumption they propose. Consider an exchange economy with three economic agents and three commodities (this is a typical example of the mobilization of the nomenclature assumption). Suppose the economic agents

⁹ “[L’objectivité sociale] signifie que l’identification *a priori* des marchandises obtenue selon la procédure décrite plus haut non seulement doit être possible pour le théoricien de l’équilibre général, mais surtout il est implicitement supposé qu’elle est connue et admise par les agents, qui doivent être capables de distinguer les marchandises les unes des autres. Cette condition est cruciale, car si la définition des marchandises par l’hypothèse de nomenclature ne constituait pas en même temps un *savoir commun* des agents elle serait inopérante : il suffit d’imaginer les conséquences désastreuses pour l’analyse de l’échange et les embarras du commissaire-priseur si par « blé rouge d’hiver n°2 » les agents n’entendaient pas tous la même chose. La raison des inconvénients qui en résulteraient est évidente : sans le postulat d’objectivité sociale des marchandises, le *concept* même du prix relatif serait dépourvu de signification.”

only partially know the nomenclature of commodities—say, the first agent’s utility function is $U_1(x_1, x_2)$, the second’s is $U_2(x_1, x_3)$, and the third’s is $U_3(x_2, x_3)$ —it is unclear why this situation would be incompatible with the nomenclature assumption, as we still assume the existence of three commodities outside of and prior to any economic procedure (which is a definition of the nomenclature assumption proposed by Carlo Benetti and Jean Cartelier). Therefore, including the common knowledge assumption into the definition of the nomenclature assumption is not straightforward.

After presenting these three criteria, which they argue demonstrate the “exorbitant” nature of the nomenclature assumption (*ibid.*, 101), Carlo Benetti and Jean Cartelier assert that the adoption of this assumption stems from the fact that “the starting point of political economy is the existence of quantitative relations in a society composed of a plurality of elements” (*ibid.*, 12)¹⁰, and that the nomenclature assumption is one way to account for these quantitative relations, which has been widely favored by political economy. However, another way to account for these relations is to assume a “set of distinct accounts kept in common units of account” (*ibid.*, 13).¹¹ Since they believe the nomenclature assumption inadequately represents the social relations between individuals within a market context (*ibid.*, 13), they propose abandoning the nomenclature assumption in favor of studying these relations through a common unit of account, which they find more suitable. We will not detail their analysis. We can simply note that some subsequent works have continued to use the nomenclature assumption in contrast to a common unit of account (e.g., Benetti 1985; Laval 1997; Ülgen 2013). However, most later studies have employed this assumption to address the issue of the foundations of the choice set available to economic agents. Notably, André Orléan (2003; 2014) and François Eymard-Duvernay (1989; 2013) have made significant contributions to the literature on this assumption.

¹⁰ “l’économie politique a comme point de départ l’existence de relations quantitatives dans une société composée d’une pluralité d’éléments.”

¹¹ “un ensemble de comptes distincts tenus en unités de compte communes.”

In summary, Carlo Benetti and Jean Cartelier propose several definitions of the nomenclature assumption and suggest that these definitions are equivalent to the combination of three assumptions: the identity criterion for distinguish commodities, the measurability assumption, and the common knowledge assumption (although they do not explicitly use these terms in their book). However, it is unclear how the combination of these three assumptions would be equivalent to their definitions of the nomenclature assumption. This is particularly problematic because most subsequent works refer to this equivalence. Specifically, the common knowledge assumption has often been employed as a defining criterion for the nomenclature assumption (e.g., Montalban 2012, 12; Boyer 2015, 6), despite the ambiguities we have highlighted. A clarification regarding the definition of this assumption was therefore necessary.

This is why we define the nomenclature assumption as an assumption that allows to consider the choice set available to economic agents as given, without requiring an explanation of its origin. On the one hand, while Carlo Benetti and Jean Cartelier conceive this assumption as a combination of three assumptions, without clear justifications, our definition is compatible with their approach and also accommodates approaches that, for instance, reject the common knowledge assumption. On the other hand, our definition applies to any choice set, whereas Carlo Benetti and Jean Cartelier focus on the nomenclature of commodities. This focus is understandable since they examine the goods are goods approach to demand theory (though they do not label it as such), where the choice set corresponds to a nomenclature of commodities. Our definition also extends to situations where the choice set available to economic agents does not correspond to a nomenclature of commodities, which is crucial for analyzing the characteristics approach (discussed in the next section). Finally, our definition captures a specific aspect of demand theory, namely the introduction of a choice set available to economic agents into a model without requiring an explanation of its origin. It is possible to combine this assumption with the common knowledge assumption or any other assumption. However, we

believe it is important for the nomenclature assumption to refer to something distinct, ensuring it does not overlap with other existing assumptions.

There are countless examples of the use of the nomenclature assumption within the goods are goods approach to demand theory. To illustrate its application, we consider an excerpt from the textbook *Microeconomic Theory* (Mas-Colell, Whinston, and Green 1995), identified as the most widely used microeconomics textbook in the United States (Liner 2002) and in Sweden (Liner 2002). In the section titled “Commodities,” the authors state:

The decision problem faced by the consumer in a market economy is to choose consumption levels of the various goods and services that are available for purchase in the market. We call these goods and services *commodities*. For simplicity, we assume that the number of commodities is finite and equal to L (indexed by $l = 1, \dots, L$). As a general matter, a *commodity vector* (or *commodity bundle*) is a list of amounts of the different commodities,

$$x = \begin{bmatrix} x_1 \\ \vdots \\ x_L \end{bmatrix}$$

and can be viewed as a point in R^L , the *commodity space*. We can use commodity vectors to represent an individual’s consumption levels. The l -th entry of the commodity vector stands for the amount of commodity l consumed. We then refer to the vector as a *consumption vector* or *consumption bundle* (1995, 18).

In the 1,000 pages of this reference textbook, no further details are provided about the nomenclature of commodities. This reflects the use of the nomenclature assumption within this textbook and, more broadly, its application in the goods are goods approach to demand theory. It is important to note that employing the nomenclature assumption does not preclude a discussion on the foundations of the choice set available to economic agents. As a matter of fact, nothing prevents an article from explaining why apples are distinguished from pears in the nomenclature of commodities. However, such an explanation can be omitted, and is actually omitted

by most works. When such an explanation is provided, it often appears somewhat extraneous because it does not influence the subsequent analysis. A notable example is found in Gérard Debreu's *The Theory of Value* (1959), which Carlo Benetti and Jean Cartelier regard as "the contemporary neo-classical economist who elaborates the most on the nomenclature assumption" (1980, 99).¹² In his book, Gérard Debreu provides the following definition of a commodity:

A commodity is defined by a specification of all its physical characteristics, of its availability date, and of its availability location. As soon as one of these three factors changes, a different commodity results (Debreu 1959, 30).

Commodities are therefore distinguished based on their differences. If two things are identical, they are considered two units of the same commodity. If they differ, they are treated as distinct commodities. Gérard Debreu uses the identity criterion to differentiate commodities (Gradoz 2024a), which involves considering characteristics when establishing the nomenclature of commodities. One might then expect Gérard Debreu to explain how these characteristics are identified and their role in determining economic equilibrium. However, this is not the case. Gérard Debreu provides no discussion on how the characteristics of commodities are identified and these characteristics play no role in his general equilibrium theory. He assumes a nomenclature of l distinct commodities (l being a finite number), representing the choice set available to economic agents. He merely notes in passing that these commodities are distinguished by their characteristics. Had he not mentioned this criterion, it would not have impacted his analysis. Therefore, Gérard Debreu's book is characterized by the use of the nomenclature assumption, despite addressing the issue of the foundations of the choice set available to economic agents. This is also why his book belongs to the goods are goods approach to demand theory, despite discussing the characteristics of commodities.

¹² "l'auteur néo-classique contemporain qui détaille le plus l'hypothèse de nomenclature."

2 The Nomenclature Assumption and the Characteristics Approach

In 1966, Kelvin John Lancaster published “A New Approach to Consumer Theory” in the *Journal of Political Economy*, which popularized the characteristics approach to demand theory. In his article, Kelvin John Lancaster contrasts his “new approach” with the one adopted by Gérard Debreu in *The Theory of Value* (1959). This opposition may seem surprising, given that Gérard Debreu distinguishes commodities based on their characteristics. However, as we have demonstrated, these characteristics play no role in Gérard Debreu’s theory. In contrast, Kelvin John Lancaster’s characteristics approach explicitly describes commodities by the values of their characteristics, with consumer preferences based on these characteristics. Therefore, one of the contributions of the characteristics approach is not the introduction of characteristics into demand theory, but rather giving them a significant role in the analysis of economic equilibrium. This is rarely mentioned in the literature on the characteristics approach, often leading to an exaggerated contrast between the goods are goods approach and the characteristics approach. Actually, the characteristics approach is constructed in analogy to the goods are goods approach, as Ronald Findlay well illustrates in his presentation of Kelvin John Lancaster’s model:

The standard theory involved considering the consumer as maximizing a utility function $U(x)$ subject to a budget constraint $px = I$, where x is an l -dimensional vector of goods, p the corresponding vector of prices and I the income of the consumer. [...] A simple version of the Lancaster approach therefore regards the consumer as maximizing $U(z)$, where z is an m -dimensional vector of characteristics, subject to $z = Bx$, where B is an $(m \times l)$ matrix representing the “technology of consumption” or the amount of each characteristic embodied in each good, and the budget constraint $px = I$ as before (Findlay 2018, 7561).

In the goods are goods approach, the choice set available to the consumer corresponds to a nomenclature of l commodities. The consumer's preference relation involves ranking all vectors (x_1, \dots, x_l) , where x_i denotes a (positive) quantity of commodity i ($i \in \{1, \dots, l\}$). The consumer's utility function is denoted $U(x_1, \dots, x_l)$. In the characteristics approach, exemplified by Kelvin John Lancaster's new approach to consumer theory, the choice set available to the consumer corresponds to a nomenclature of m characteristics. The consumer's preference relation involves ranking all vectors (y_1, \dots, y_m) , where y_j denotes a (positive) quantity of characteristic j ($j \in \{1, \dots, m\}$). The consumer's utility function is denoted $U(y_1, \dots, y_m)$. Formally, these two models are very similar. In particular, they both rely on the nomenclature assumption. In the goods are goods approach, the nomenclature assumption allows to consider the nomenclature of commodities as given, without requiring an explanation of its origin. Therefore, one can introduce apples and pears without having to explain why the choice set is limited to apples and pears, how apples and pears are measured and accounted for, or what differentiates apples from pears. Similarly, in the characteristics approach, the nomenclature assumption allows to consider the nomenclature of characteristics as given, without requiring an explanation of its origin. Therefore, one can introduce vitamins and calories without having to explain why the choice set is limited to vitamins and calories, how vitamins and calories are measured and accounted for, or what differentiates vitamins from calories. In the characteristics approach, apples and pears are considered as mere aggregates of vitamins and calories (Eloire and Gradoz 2024). This observation highlights the importance of defining the nomenclature assumption with reference to the choice set available to economic agents, rather than solely in terms of the nomenclature of commodities. In the characteristics approach, the choice set available to economic agents corresponds to a nomenclature of characteristics. This does not prevent the nomenclature assumption from being used in the same manner as in the goods are goods approach to demand theory.

In some models of the characteristics approach, firms do not choose the values of the characteristics of their commodity. This scenario is notably explored by Harold Hotelling (1929, 45) as a preamble to the presentation of his famous two-firm location model. In this preamble, he assumes that each firm is positioned along the linear city at a location it did not choose. Each firm is associated with a commodity that is described by the firm's location. This is why Hotelling's model belongs to the characteristics approach. In this section, we focus on models where each firm is associated with a single commodity, but the insights proposed here also apply to scenarios where this is not the case. If firms do not choose their location, they also do not choose their commodity. In this version of Hotelling's model, the nomenclature of commodities is considered as given, determined outside of and prior to any economic procedure. The only difference from the goods are goods approach is that commodities are described by their location. The nomenclature assumption applies both to the nomenclature of characteristics, which corresponds here to location, and to the nomenclature of commodities, which corresponds here to two commodities. This observation applies to all models within the characteristics approach where firms do not choose the characteristics of their commodity.

Many models within the characteristics approach allow firms to choose the values of the characteristics of their commodity. This is often referred to as "commodity selection" (e.g., Spence 1976), where firms' decision is based on the anticipated behavior of other firms, consumer preferences, production costs, or available information. In these models, the nomenclature of commodities is *endogenous*, namely determined by the model's equilibrium—or indeterminate if no equilibrium exists, as in Hotelling's original 1929 model (d'Aspremont, Gabszewicz, and Thisse 1979; Aydinonat and Köksal 2019). Therefore, the nomenclature of commodities is not determined outside of and prior to any economic procedure. It is the outcome of firms' decision. However, endogenizing the nomenclature of commodities does not imply abandoning the nomenclature assumption. Rather, this

assumption is applied to the nomenclature of characteristics instead of the nomenclature of commodities, as the nomenclature of characteristics corresponds to the choice set available to economic agents. As before, there are countless examples of the use of the nomenclature assumption within the characteristics approach. To illustrate its application, we consider an excerpt from Sherwin Rosen's article "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition," which is the sixth most-cited article in the *Journal of Political Economy* (Amiguet et al. 2017):

The class of goods under consideration is described by m objectively measured characteristics. Thus, any location on the plane is represented by a vector of coordinates $Z = (z_1, z_2, \dots, z_m)$, with z_i measuring the amount of the i -th characteristic contained in each good. Products in the class are completely described by numerical values of Z and offer buyers distinct packages of characteristics. Furthermore, existence of product differentiation implies that a wide variety of alternative packages are available (Rosen 1974, 35).

In Sherwin Rosen's article, no further details are provided about the nomenclature of characteristics. It is considered as given, without addressing how this choice set is derived. While the model endogenizes the nomenclature of commodities, it does not do so for the nomenclature of characteristics, which constitutes the choice set available to economic agents. To summarize, the characteristics approach, like the goods are goods approach, relies on the nomenclature assumption. In the goods are goods approach, this assumption applies to the nomenclature of commodities. In the characteristics approach, it applies to the nomenclature of characteristics. In both cases, the assumption applies to the choice set available to economic agents. This similarity between the goods are goods approach and the characteristics approach, as well as the role of the nomenclature assumption in the characteristics approach, have not been previously explored in the literature.

3 Yoram Barzel and the Costs Involved in Measuring the Characteristics of Commodities

The nomenclature assumption is sometimes presented as a simplifying assumption (Orléan 2015, 104), allowing to focus on exchanges by setting aside considerations related to the choice set available to economic agents. However, this assumption has significant implications (Eymard-Duvernay 2013, 146). We will illustrate these implications by focusing on the goods are goods approach to demand theory. We could draw on the works of the *economics of conventions* dedicated to this assumption, which have highlighted the role of “quality conventions” in the construction of the nomenclature of commodities—a role that is obscured by the use of the nomenclature assumption (Eymard-Duvernay 2013; Orléan 2014). Similarly, we could revisit the book by Carlo Benetti and Jean Cartelier, which suggests that the nomenclature assumption entails an inadequate representation of social relations between individuals within a market context:

The assumption that the starting point of economic reflection is the existence of a physical world given independently and prior to any social activity radically excludes any attempt to describe the objects or subjects of economic activity as products of specific social relations. [...] More generally, the nomenclature assumption prohibits any approach other than the mere association of a quantity (value)—which may be zero in the event of a crisis—with elements that already exist in another form, such as a physical form (1980, 13).¹³

However, for the sake of conciseness, we will focus on Yoram Barzel’s analysis of the costs involved in measuring the characteristics of commodities. In 1982, he

¹³ “La présupposition que le point de départ de la réflexion économique est l’existence d’un monde physique donné indépendamment et antérieurement à toute activité sociale interdit radicalement toute tentative de description des objets ou des sujets de l’activité économique comme produits de relations sociales spécifiques. [...] Plus généralement, l’hypothèse de nomenclature interdit toute démarche qui ne soit pas la pure et simple association d’une grandeur (valeur), éventuellement nulle en cas de crise, à des éléments existants déjà sous une autre forme, physique par exemple.”

published “Measurement Cost and the Organization of Markets” in the *Journal of Law & Economics*. In the introduction, he emphasizes that “people will exchange only if they perceive what they get to be more valuable than what they give. To form such perceptions, the attributes of the traded items have to be measured” (1982, 27). The measurement of these attributes—which we will refer to as characteristics for consistency with the rest of our article—incurs costs and is susceptible to measurement errors. This issue is also extensively studied in *statistical quality control* (e.g., Shewhart 1931). Yoram Barzel uses this starting point to explore various topics, such as information asymmetries, the role of market intermediaries, and the implementation of product warranties. Here, we will focus on the relationship between the costs of measuring characteristics and the nomenclature of commodities.

Yoram Barzel provides the example of an orange, whose weight can be measured accurately and at low cost, unlike the quantity of pulp or juice it contains. In this scenario, sellers will use weight to describe oranges and may not offer a more detailed description, as the relatively low selling price of oranges does not compensate the costs of a more precise description. If the costs of measuring characteristics were zero, oranges would be described based on all the characteristics that matter to consumers. The resulting nomenclature of commodities would therefore reflect the characteristics that matter to consumers, and prices would be set accordingly. Conversely, when measuring characteristics is costly—which Yoram Barzel argues is true for all commodities—“the seller cannot capture the entire value of his merchandise had it been costlessly described” (Barzel 1982, 31). The description of commodities, and therefore the nomenclature of commodities, results from an economic trade-off for firms. As a matter of fact, a more detailed description of commodities can raise their price, but this increase must outweigh the costs of providing a finer description. Consequently, prices depend on the nomenclature of commodities, and the nomenclature of commodities, in turn, depends on prices. The nomenclature of commodities is therefore a dimension of economic equilibrium. By

using the nomenclature assumption, this dimension of economic equilibrium is excluded from the analysis, a fact that is rarely acknowledged in the goods are goods approach to demand theory. This assumption, therefore, has significant implications. Notably, we agree with François Eymard-Duvernay, who stated that “the nomenclature assumption conceals the process of constructing goods” (Eymard-Duvernay 2013, 136).¹⁴ In his book *The Structure of Economics* (1990), Eugene Silberberg offers an analysis similar to that of Yoram Barzel. Eugene Silberberg’s book provides one of the most striking examples of the use of the nomenclature assumption in demand theory, illustrating many of the points raised in this article:

Most commodities have several characteristics, each of which presumably generates utility to consumers. Yet usually, only one of these characteristics is used to label the commodity. Consider the example of eggs. Eggs come in various volumes, weights, colors, and degrees of firmness of yolk and white. The fact that egg sizes are by weight rather than volume is due to the relative ease, i.e., lower cost, of measuring that dimension than, say, volume. [...] Diamonds, on the other hand, are extensively measured. They are classified by color (white, blue-white, yellow, etc.), various degrees of departure from flawless crystal structure, shape of cut (round, marquise, emerald, etc.). Each of these characteristics is carefully measured, and prices vary accordingly. Diamonds are so extensively measured and categorized because, given the “high” price of the basic material of diamonds, measurement is relatively cheap. Hence, a great deal of measuring is done on diamonds, and relatively less measuring is done on lower-valued commodities. [...] The notion of a commodity is thus not a technological datum but dependent in large part on the economic costs of characterization of the good. We shall ignore these matters, however, in the forthcoming discussion. Assume that there are n well-

¹⁴ “l’hypothèse de nomenclature masque l’opération de constitution des biens.”

defined commodities, x_1, \dots, x_n , which the consumer purchases in positive amounts, at prices p_1, \dots, p_n , respectively (Silberberg 1990, 380).

In this excerpt, Eugene Silberberg emphasizes that the costs involved in measuring the characteristics of commodities explain why diamonds are finely distinguished, while eggs are not. Because eggs are sold at a low price, the costs involved in measuring their characteristics is too high relative to the expected profit from a more detailed description. In contrast, since diamonds are sold at a high price, the cost of measuring their characteristics is comparatively lower, justifying their extensive measurement and fine categorization. However, the high price of diamonds is directly linked to the meticulous work of categorizing them (Bessy 2003). This illustrates the mutual determination between the nomenclature of commodities and the price vector at equilibrium. Despite this, Eugene Silberberg suggests ignoring these considerations. He employs the nomenclature assumption by presupposing the existence of a nomenclature of n “well-defined” commodities, without addressing how this nomenclature is derived.

4 Conclusion

This article has examined the use of the nomenclature assumption in demand theory. We defined this assumption as the assumption that the choice set available to economic agents is considered as given, without requiring an explanation of its origin. To analyze the applications of this assumption in demand theory, we distinguished between the goods are goods approach and the characteristics approach. In the goods are goods approach, the choice set available to economic agents corresponds to a nomenclature of commodities, and the nomenclature assumption allows this nomenclature to be treated as given. While characteristics may be mentioned as a criterion for distinguishing between commodities, they play no actual role in this approach. In the characteristics approach, the choice set corresponds to a

nomenclature of characteristics, and the nomenclature assumption allows this nomenclature to be considered as given. When firms do not choose the values of the characteristics of their commodity, the nomenclature of commodities is also considered as given. If firms do choose these values, the nomenclature of commodities becomes endogenous, meaning it is determined at the model's equilibrium—or is indeterminate if no equilibrium exists. This article has highlighted the central role of the nomenclature assumption in demand theory and provided a novel comparison between the goods are goods approach and the characteristics approach. Future research could investigate the use of the nomenclature assumption in relation to other choice sets available to economic agents, such as the nomenclature of actions in game theory or the nomenclature of productivity levels in labor economics. Additionally, it would be worthwhile to investigate other aspects of demand theory models that are considered as given, such as the number of firms or the nomenclature of states of nature (Orléan 2014).

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