

Conspicuous Ethics: An Economic Theory of Ethical Consumption

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Abstract

We study ethical consumption behavior in a model motivated by conspicuous ethics. We propose a motivation for ethical consumption based on the objective of esteem maximization, and show that prices of ethically conspicuous goods perform the role of informing consumers about the way goods are produced and distributed. In our model of ethical consumption, therefore, ethical values enter the utility through a price dependent preference ordering and a characterization of ethical conspicuous goods. We hypothesize that ethical consumers compete for moral superiority by displaying their consumption choices. We show that the objective of maximizing esteem is well defined and that a price dependent esteem function exists. This requires establishing the conditions of rational ethical consumption behavior, which we do without a transitivity assumption.

JEL: D11, D91

Key Words: Ethical Preferences, Consumption Behavior

1 Introduction

Ethical consumers strictly prefer bananas to bananas according to the standard consumer model. The study of this consumption paradox is the subject of this paper. To illustrate the paradox consider two nearly identical commodities x and \bar{x} which only distinguish themselves in the way they are produced. Their physical characteristics are identical. We observe that the standard characterization of a utility function in the neoclassical consumer model does not permit consumers

distinguishing between the two commodities. It follows that $u(x) = u(\bar{x})$, where u is some utility function. This is a strong intrinsic property of the standard consumer model, which might not always be satisfied. To see this consider a situation where commodities are produced and distributed under the conditions of a social label. A typical example would be a banana produced under Fair Trade certification. We assume that the physical properties, such as i.e., taste, color, and shape, of banana x are identical to those of banana \bar{x} except that the later is produced in an ethically consistent way as indicated by the Fair Trade certification. A blindfolded consumer would not be able to distinguish between the two bananas. However, we empirically observe that $u(\bar{x}) > u(x)$ for some consumers. Consumers satisfying this strict inequality behave irrationally according to the standard consumer model, suggesting a violation of the reflexivity axiom on the preference relation. This apparently paradoxical consumption behavior, however, typically mirrors ethical consumption behavior. In this paper, we define a class of consumers who satisfy this inequality. Such consumers do not only care about the physical properties of goods, but they also pay attention to the way goods are produced and distributed.

There is another ethical consumption property which seems paradoxical according to the standard consumer model. Ethical consumers prefer purchasing more expensive bananas \bar{x} at price \bar{p} to relative cheaper ones x at price p with $\bar{p} > p$. Since the standard consumer model cannot distinguish between \bar{x} and x it follows that for $\bar{p} > p$ demand $\bar{x} < x$. This illogical behavior suggests that the standard consumer model does not provide sufficient structure to differentiate between standard preferences and extended ethical preferences which also include properties regarding how goods are produced and distributed. Such preferences also seem to be positively correlated with prices, an idea of utmost importance in the theory developed in this paper, which is robustly evidenced by empirical studies.

A final ethical consumption paradox states that ethical consumers avoid consumption of a banana x if $x \neq \bar{x}$. They also neglect consumption of \bar{x} if $\bar{p} \not\geq p_{min}$ resulting in demand $\bar{x} = 0$. Such consumption behavior is predominantly visible in situations when consumer organizations call for consumption boycotts and organize campaigns against unethical producers. The standard consumer model does not permit such complex consumption behavior due to the restriction of preference orderings to the physical properties of commodities and their independence of prices.

Ethical consumers behave strangely according to standard economic theory. They avoid the consumption of commodities if they are not produced and distributed in a certain ethical way, boycott the consumption of ethically produced goods if they don't satisfy a minimum price condition, and they prefer more expensive ethically produced goods over cheaper (non-ethically produced) goods.

New theoretical developments are required in support of the vast amount of empirical evidence of such consumption behavior. To fill this gap, the motivation of this paper is to provide a theoretical explanation of ethical consumption behavior. This, however, requires assessing the axioms of preferences and the motivation to why ethical consumers behave in a certain way. Both lead to new theoretical developments in this paper.

An increasing number of consumers base their daily consumption decisions on the basis of ethical values, such as human rights, environmentally friendly production, sustainable production and distribution standards, and animal well-being (Tallontire and Blowfield (2001)). Ethical consumers, hence, are consumers who beyond making rational consumption decisions on price-quantity apply certain values when making consumption decisions. According to Doane (2001), ethical consumers feel responsible towards society and express these feelings via their purchasing behavior. Examples of positive ethical consumption is the purchase of fair trade, organic, and “green” products¹. In 2017 ethical consumers in the UK spent a total of £83.3 billion on ethical products of which nearly half (£39.8 billion) was spent on ethical financial activities such as ethical banking and investment².

This emerging industry sector encompasses any banking system that embraces environmentally and socially conscious practices. The ethical goods market accounted for £40.7 billion, suggesting a 3.5% increase in ethical spending on ethically produced and distributed goods compared to 2016. Among all ethical products, “ethical food and drink” accounting for £11 billion is the fastest growing market (16.3%). This is the largest growth rate since 2012. The food and drink market comprises Organic, Fairtrade, Rainforest Alliance, Free Range Eggs, Vegetarian, RSPCA assured products, and Sustainable Fish. While the Rainforest Alliance maintains the largest market value of £2.95 billion within the food and drink market segment, its growth rate of 10.5% is tripled outweighed by the Sustainable Fish sector, which is the fastest growing ethical food sector in the UK. We estimate that in 2014 the ethical consumer population in the UK accounted for 19.7 million people. An ethical consumer is characterized by the willingness to purchase ethically produced and distributed goods together with the willingness to pay higher prices for such goods. According to a study by the Department for Business Innovation & Skills³ 38% of the UK population aged over 16 years belong to the class of strong (9 %) or occasional (29%) ethical consumers.

Ethical consumers are classified as strong if they are well informed about the products they purchase, and have a high willingness to buy and pay for ethically

¹See Tallontire and Blowfield 2001 for a definition of positive and negative ethical consumption.

²Tridos bank, <https://www.tridos.co.uk>

³Gov. UK, <https://www.gov.uk/government/statistics/ethical-retail-public-views>

produced goods. Occasional ethical consumers also satisfy these properties but much weaker. We estimate that in the UK, 4.399 million people are classified as strong ethical consumers. The strong ethical consumer female population is slightly larger than the male population. On average ethical consumption per capita expenditure for the strong ethical consumer class accounts for £18,244 of which £1,964 is attributed to the ethical food & drink market. The age group 35-44 years is the most significant ethical goods consumer group in terms of ethical spending followed by the age group 55+ and the retired group age 65+.

Ethical consumers do not only spend income on ethically produced goods and services but also exhibit negative consumption behavior. Negative consumption refers to the boycott of consumption of unethically produced goods and services. This peculiar consumption behavior is a property of ethical consumption. There is a severe lack of economic theory addressing this phenomenon. In this paper, we argue that negative consumption cannot be ignored in the development of an ethical consumer model. The total value of ethical consumption boycotts in the UK in 2017 was £2.7 billion at 7% growth compared to the previous year. The ethical food market segment seems to be the most neglected market at 43.9% of total market value. The combined grand total of the ethical goods market value in 2017 was £2.743 billion, of which the most neglected market is food & drink (£1.206) followed by transport (£1.009 billion) and personal (£528 millions)⁴.

Hence, recent market developments indicate that negative consumption is a property of ethical consumption which should not be disregarded in a complete theory of ethical consumption behavior. The history of consumption boycotts in the UK according to Smith (1990) dates back to 1327, when the citizens of Canterbury imposed a consumer boycott on the Christ Church Monastery. In 1971, after English government refused to abolish slaves, 300,000 consumers boycotted the consumption of sugar produced by slaves with the effect that the sugar price dropped by nearly 50%(BBC). On the other hand, however, the price of non-slavery based sugar production from India increased tenfold over the period of two years. The recent history of consumer boycotts, as we know them today, dates back to the development of trade unions and the co-operative movements in the early 19th century⁵. In 1998 FLAC was supported by 1.3 million consumers in the UK who signed a petition for better labeling of food goods.⁶ Smith (1990) provides a

⁴Data are collected from the Ethical Consumer Reports 2010-2018, <https://www.ethicalconsumer.org/>

⁵National Consumers League (1997), "Apparel Industry Code of Conduct: A Consumer Perspective on Social Responsibility", presented at Notre Dame Center for Ethics and Religious Values in Business, October 1997.

⁶Free Legal Advice Centers (FLAC) is an independent human rights organization which promotes equal access to justice for all.

comprehensive overview of consumer boycotts in the UK.

Ethical consumers belong to a group of informed consumers, who express their ethical values through positive and negative consumption activities. The problem for a producer, therefore, is to deliver information to consumers about how goods are produced and distributed. Social labeling is an increasingly used strategy by firms and policy makers to effectively inform consumers about the manner goods are produced and distributed. The spectrum of social labeling is wide, ranging from voluntary labeling initiatives to policy labeling initiatives imposed by the regulator. Zedek et al (1998) define a social label as “words and symbols associated with products or organizations which seek to influence the economic decisions of one set of stakeholders by describing the impact of a business process on another group stakeholders”. At its core the definition provides a way for firms to convey information to consumers about the specific characteristics under which goods are produced and delivered. Zedek's definition is independent of product prices, which, however, may also provide information about ethical production and distribution processes. We, therefore, provide a more general and mathematically tractable definition of a voluntary social label, which includes prices and descriptive information about ethically produced goods.

Fair Trade is an example of a voluntary social labeling initiative based on an organized social movement and market-based approach to help producers in developing countries to obtain better trading conditions and promote sustainability. Fair Trade is a project generated by the demand for ethically labeled goods (Walton (2010)). The main feature of the Fair Trade movement is a product label aimed at informing consumers that producers receive (i) a fair price for their product, and (ii) that goods are produced under certain ethical conditions (Steinbruecken and Jaenichen (2007)). Examples of such labels are Max Havelar, TransFair, and Fairtrade Mark. Fair Trade consumers are ethical consumers with a high willingness to inform themselves about the manner goods are produced and distributed⁷. They also have a high willingness to pay for ethically produced goods as shown at the example of the Fair Trade coffee market. Basu and Hicks (2005) and P. Pelsmacker and Rayp (2005) analyze the stated preferences of students in the US and Canada and show that a positive relationship between Fair Trade prices and demand for ethically produced coffee exists. These results have been replicated for revealed preferences of customers of supermarkets in the same countries by Loureiro and Lotade (2005) and J. Cranfield and Masakure (2010). Cailleba and Casteran (2009) show by a revealed references approach that customers of supermarkets are willing to pay 3.54 Euros above equilibrium price for a pack of 250 grams in France. A similar result is established in Canada by C. Arnot (2006). In

⁷Gov. UK, <https://www.gov.uk/government/statistics/ethical-retail-public-views>

China, S.H. Yang (2012) showed that on average consumers are willing to pay 22% above equilibrium price for Fair Trade coffee.

The empirical evidence on the high willingness to pay across all markets of ethical consumption is overwhelming. Prices also play another role in ethical consumption behavior. Ethical consumers care about a minimum price, which guarantees a minimum income for the producers. Should the minimum price condition not be satisfied then they neglect the consumption of ethically produced goods. Moreover, ethical consumers are willing to pay a premium as evidenced by the extensive literature on the high willingness to pay. These important properties have not been dealt with in the current literature on ethical consumption theory. In order to capture the various roles prices play in a model of ethical consumption we introduce price dependent preferences. Hence, we consider the price premium as a piece of information about "the way" goods are produced and the minimum price as a condition which triggers negative consumption, if not satisfied. We also consider a proportion of the market price (premium) to represent ethical values. This requires disentangling the price into a market price, which enters the budget constraint of the consumer model, and a price index, which enters the utility of the consumer representing ethical values regarding production and distribution processes. In this way, ethical production enters the utility of the ethical consumers through price information.

In order to model property (ii), we introduce ethical conspicuous goods. Ethical conspicuous goods are commodities characterized by a set of specific ethical values regarding production processes as described by a social label. In our model, hence, commodities are not only characterized by their physical, spatial, and temporal properties Debreu (1959), but also by ethical production properties as indicated by the social label. Characterizing ethically produced goods in this particular way enables us to overcome the problem of how to model "nearly identical goods" in the utility of the ethical consumer. We define nearly identical goods by goods, which have identical physical properties but differ only in "the way" they are produced. It is readily observed that standard utility functions $u : \mathbb{R}^n \rightarrow \mathbb{R}$ fail to distinguish between i.e., coffee and ethically produced coffee Debreu (1959),. Hence, the new approach considered in this paper.

In this paper we consider a group of consumers who exhibit rather unusual consumption behavior according to standard economic theory. This group is rapidly growing in size and in purchasing power and therefore cannot be ignored. New economic theory developments are required to explain ethical consumption behavior. Introducing ethical preferences into the consumer model is a major development towards a theory of ethical consumption. This paper contributes towards such a theory by establishing a link between prices and ethical values through the introduc-

tion of price dependent ethical preferences and social labels providing a descriptive characterization of ethical conspicuous goods. Our theory explains the following consumption behavior.

Ethical consumers prefer to pay higher prices for identical goods, if they are produced in a particular way, suggesting a positive correlation between prices and quantity demanded. This empirically validated behavior seems counter intuitive with respect to the law of demand suggesting the contrary, and hence demands the development of novel concepts motivating ethical consumption. We attempt to provide this motivation by introducing the concept of conspicuous ethics, which implies that ethical consumers like to display their morally responsible economic choices towards other members of society by purchasing more expensive ethically produced goods. We hypothesize that ethical consumers maximize esteem and provide a development of this idea. We consider an esteem function $E(u(x; p), p)$, which is a composite function of the utility function and the price system, p . In particular, we consider a utility function based on a price dependent preference relation, where the price performs the role of capturing the ethical production and distribution process. In this way, our esteem function is based on an ethical preference relation in which ethical values enter the utility through a price system. Ethical consumers neglect the consumption of identical goods, if they are not produced in a particular way. A consumer boycott is defined by the collection of ethical consumers refusing to purchase unethically produced goods. The esteem function $E(u(x; p), p)$ provides a way to “logically” model neglecting consumption of a good relative to another identical good which is ethically produced. The theory provided in this paper is sufficiently rich in structure to model such behavior, a property overlooked by the theory on ethical consumption.

The remainder of the paper is organized in the following way. Section two discusses the sparse literature on the theory of ethical consumption. We examine in some depth the New Consumer Theory, also known as the Lancaster model, which is widely applied to Fair Trade. The novelty of this theory is that it assumes that consumers derive utility from the intrinsic properties of goods rather the goods themselves. This requires a formulation of a preference ordering over a consumption-ethical value space. We show that such a characterization of an ethical preference ordering is not free of pitfalls. We also examine Veblen’s theory of conspicuous consumption, and generalize this theory to a model of conspicuous ethics. The model of the ethical consumer is derived in a three steps in Section three. We also present the main result in this section. The paper concludes in Section 4 with suggestions for future research.

2 Related Literature

In "The Theory of the Leisure Class", Veblen (Veblen (1899, chapter 4, p.35-36) recognizes that the consumption of "more excellent goods"⁸ is evidence of wealth and that failure to do so becomes a mark of inferiority and demerit. Veblen's theory of individual consumption is a theory based on individuals maximizing "esteem" by displaying wealth in order to distinguish themselves from other members of society. On a macroeconomic level, he describes the evolution of a society (social classes) based on the idea that individuals carve for esteem through the consumption of conspicuous goods. Veblen argues that a utility function, which, is independent of prices is not a suitable framework for the analysis of consumption behavior of conspicuous goods. Implicit in his formulation of the consumer, he believes that prices do not only signal the scarcity of goods in the coordination of consumption allocations, but they also affect the individual's preferences. Veblen's theory is one of the most influential critiques of the neoclassical economic model, partially criticizing it for its restriction of the utility function to the characteristics of goods. Veblen's critique inspires a new development of price dependent utility function within the neoclassical model. His views were first analytically introduced in Samuelson (Samuelson (1947), p.119-121), who formulates a model of conspicuous consumption with price dependent utility functions. In this model, he considers a price-parameterized utility function and a conspicuous good represented by gold. Samuelson's seminal work initiates two research directions of price dependent preferences. One research line continues to search for the motivation of price dependent preferences in the context of consumption of conspicuous goods, and the other research line focuses on the demand for money and other financial assets.

Here we pursue a new development of price dependent preferences in the context of ethically conspicuous goods. At variance to the existing literature on price dependent utility functions, we consider Veblen's original philosophy of esteem maximization, which yet lacks a rigorous formulation within the neoclassical model. The search for price dependent utility functions in the context of the neoclassical theory begins with Scitovsky (1944) providing the rationale for taking prices as an index of product quality. He states that judging quality by its price is rational if consumers are informed about product qualities. However, Scitovsky does not establish the conditions of rational behavior, instead focusing on price effects, also known as Veblen effects, where prices and quantity demanded are positively correlated. Veblen effects are also analyzed in Leibstein (1950) and Alcaly and Klevorick (1970) with Kalman (1968) and Pollak (1977) being mathematically the most rigorous. This

⁸"More excellent goods" refers to product quality and luxury goods in this context.

literature principally focuses on the motivation for price dependent utility functions and the derivation and implications of wealth effects by considering variations of the Slutsky equation. We, however, are primarily interested in establishing the conditions of rational choice, leading to the existence of a price dependent utility function. Price dependent utility functions have also been introduced into the "New Consumer Theory", also known as the Lancaster model Lancaster (1971), in the context of judging quality by price and snob appeal Alcala and Klevorick (1970), where the price enters the utility as one of the characteristics of the goods. The paper establishes analytically the conditions of positive correlation between prices and demand for goods.

"The theory of consumer behavior in deterministic situations as set out by, say Debreu (1959) or Uzawa (1960) is a thing of great aesthetic beauty, a jewel set in a glass case". Lancaster (1971).

Standard economic theory assumes that consumers derive utility from the consumption of goods.⁹ According to Debreu, economic goods are characterized by their physical properties, time, and space. A good characterized by these properties is a physical quantity in the space of real numbers \mathbb{R} and it is assumed that a consumer derives utility from its consumption. Lancaster breaks away with this tradition, criticizing this theory for its denial of the relevance of intrinsic properties of goods. He introduces the hypothesis that (a) consumers do not derive utility from the goods themselves, but from their properties or characteristics. Moreover, he assumes that (b) a good can possess many characteristics, and that (c) goods in combination may possess characteristics different from those pertaining to the goods separately Lancaster (1971).

Using (a) he defines a consumption model where the consumer derives utility from the characteristics of the goods denoted by $u(z)$, where $z \in \mathbb{R}^N$ is a vector of characteristics and $u : \mathbb{R}^N \rightarrow \mathbb{R}$ is a continuously differentiable ordinal utility function satisfying the usual concavity conditions. Using (b) and (c) he defines goods $x \in \mathbb{R}^L$ and characteristics of goods z in terms of consumption activities $y \in \mathbb{R}^M$, where $f : \mathbb{R}^M \rightarrow \mathbb{R}^L$ and $g : \mathbb{R}^M \rightarrow \mathbb{R}^N$ are smooth mappings. It then follows that the characteristics of goods are indirectly described by a composite mapping

$$z = g(f^{-1}(x)).$$

In Lancaster's model a consumer derives utility from the characteristics of a good. Hence, a characteristic bundle $z \in \mathbb{R}^N$ is assumed to be quantifiable. Moreover, given the continuity of f^{-1} and g it holds that z is a continuously measurable

⁹Lancaster refers to Debreu (1959), Uzawa (1960) and neoclassical economic theory in general.

quantity. Here, we argue that this is a strong assumption that might not always be satisfied in the context of ethical consumption, i.e., in the context of modeling Fair Trade labels. Consider a good x , say coffee, produced under "no child labor" product certification. Hence "no child labor" is a characteristic of the good produced, and in Lancaster's model a consumer derives utility from it. Lancaster's model states that there is a continuous negative correlation between child labor and the utility of an ethical consumer. However, in our definition of ethical consumption, consumers who tolerate some level of child labor are not considered to belong to the class of ethical consumers. More generally, we argue that ethical consumption, where human rights represent characteristics of the consumption goods are not best modeled as continuous variables. Consider the minimum wage as another characteristic of a good. Then Lancaster's model implicitly assumes that the higher the minimum wage the more utility consumers derive from consuming these goods. But this, however, contradicts the concept of a minimum wage, which is intended to guarantee some standard of living only.

Despite this deficiency, there are interesting empirical applications of the Lancaster model that we now wish to revise. Let's consider the earliest applications of Lancaster's model in the context of food safety Baker (1993). Baker reformulates Lancaster's model in terms of a consumer deriving utility from consumption services denoted by $u(s_1, \dots, s_K)$, where consumption services are expressed as

$$s_k = h_k(x, z), \text{ for } k = 1, \dots, K,$$

where $x \in \mathbb{R}^I$ is a bundle of consumption goods, $z \in \mathbb{R}^{IJ}$ is a matrix of characteristics, and $h_k : \mathbb{R}^I \times \mathbb{R}^{IJ} \rightarrow \mathbb{R}$ for $k = 1, \dots, K$ is a mapping of goods and characteristics into the space of consumption services \mathbb{R}^K . Baker does not elaborate on the specifics of this mapping beyond mentioning that it requires continuity and that each commodity is described by the same product characteristics. Similarly to Lancaster, Baker models the characteristics (consumption activities derived from the characteristics) as continuously measurable quantities. In addition, Baker requires each consumption good to be characterized by the same set of characteristics. This is a restrictive assumption in the context of social labels. Similar to the model formulated in Baker, Cranfield et al model consumer preferences for Fair Trade coffee in a Lancaster type framework (Cranfield et al (2010)). Their empirical model does also not model ethical values as characteristics of the consumption goods. Heinmueller et al expand a similar analysis framework to include observable characteristics in the utility of the consumer. However, the model also lacks a characterization of goods in terms of ethical values¹⁰. In the comprehensive review

¹⁰Discussion paper by J. Hainmueller, M.J. Hiscox, and S. Sequeira on "Consumer Demand for the Fair Trade Label: Evidence from a Multi-Store Field Experiment".

on Fair Trade consumption Andorfer and Liebe classify the Lancaster model as one of the main theoretical approaches to analysis Fair Trade consumption but do not provide any further insights into the model on the characterization of consumption goods Andorfer and Liebe (2012).

3 The Ethical Consumer Model

The theory on price dependent preferences is sparse. The various hypotheses motivating the study of price dependent preferences are: judging the quality of a good by its price Veblen (1899), "Snob appeal" of a good Scitovsky (1944), and treatment of money and other financial assets in temporal equilibrium models (Samuelson (1947)). In this paper, we consider a new hypothesis for introducing price dependent preferences into consumer theory. In our model, prices perform the role of informing consumers about ethical production. We assume there exists a group of socially responsible consumers represented by an index $i = 1, \dots, m$ who do not only care about their own consumption of goods $l = 1, \dots, n$, with consumption bundle $x_i \in \mathbb{R}_+^n$, but they also care about certain ethical and social conditions $j = 1, \dots, k$ regarding production and distribution of these goods. Associated with a consumption bundle there is a price system $p \in \mathbb{R}_+^n$. Let the ethical consumer price \mathbf{p} be defined by the global market price p_M plus a premium p_E such that

$$\mathbf{p} = p_M + p_E \geq p_{min}, \quad (1)$$

where $p_{min} > 0$ and $p_E \geq 0$ is a premium (R. Dragusanu and Nunn (2014)), Figure 1 on p.219-220). It is assumed that the ethical price system $\mathbf{p}=(p^1, \dots, p^n) \in \mathbb{R}_{++}^n$ satisfies the normalization $\mathcal{S} := \{\mathbf{p} \in \mathbb{R}_{++}^n : \mathbf{p}^n = 1\}$ as the numeraire convention. This price normalization is useful in the calculation of derivatives. Moreover relative prices lead to demand functions which are homogeneous of degree zero. Such functions provide meaningful welfare analysis (Pollak (1977) and K.Arrow and F.Hahn (1991)). In our model prices do not only signal the scarcity of resources in their efficient allocation process but also all these things our consumers care about regarding ethical production and distribution. Later we will disentangle to role of the price system into a price index which enters the preference relation of the consumer and a price which enters the budget constraint. Associated with an ethical price system \mathbf{p} there are $l = 1, \dots, n$ ethically produced and distributed consumption goods. We now characterize a consumption good $x_l^i \in \mathbb{R}_+$ in terms of ethical values such as no child labor, environmental friendly production, minimum wages, safe work conditions, gender equality, human rights, etc.. While some of these ethical values are quantifiable, others are clearly not. Hence, we introduce an information

array e^l collecting the words and symbols about production conditions associated with a good x_i^l . We assume that each good l is characterized by $j = 1, \dots, k$ ethical values $e^{lj} = (e^{l1}, \dots, e^{lk})$ ¹¹. Each ethical value is indexed by $j \in 1, \dots, k$ and is assumed to be known to an informed consumer. The collection of all ethical values associated with a consumption bundle x_i is an information array given by

$$e = \begin{pmatrix} e^{11} & \dots & e^{1k} \\ \vdots & \ddots & \vdots \\ e^{n1} & \dots & e^{nk} \end{pmatrix}$$

It follows that a consumption good is characterized by a quantifiable physical property x_i^l and an associated set of ethical values e^l , providing a description of production and distribution conditions regarding environment, health, gender, animal well-being, etc.. An ethically produced good is hence denoted by $x_i^l|_{e^l} \in \mathbb{R}_{++}$. Note that $x_i^l|_{e^l} \neq x_i^l|_{e^{l'}}$ for $e^l \neq e^{l'}$. Our characterization of goods states that two physically identical goods produced under different ethical conditions are “nearly-identical” goods. The physically identical goods only differ in the way they are produced. Ethical consumers are informed consumers who can distinguish between such goods. A social label conveys this information to consumers. Our definition of a consumption good is a generalization of the characterization of goods by Debreu (1959), which are defined by their physical, temporal, and spatial nature, to goods which also depend on a set of ethical values. We denote an ethical consumption bundle $x_i|_e$ by

$$\chi_i \in \mathcal{X}_i, \tag{2}$$

where $\mathcal{X}_i \subseteq \mathbb{R}_+^n$ is the consumption space characterized by ethical attributes e . We label goods $\chi_i \in \mathcal{X}_i$ satisfying such characteristics as ethical conspicuous goods. We formalize the idea of conspicuous goods in the subsequent three definitions.

Definition 1 (Ethical conspicuous goods). *An ethical conspicuous consumption bundle $\chi_i \in \mathcal{X}_i$ is defined by a consumption bundle $x_i \in \mathbb{R}_+^n$ characterized by an array of descriptive ethical values e .*

On the production side producers seek for social label certification in order to convey information about ethical production and distribution standards. Using (1) and (2) we introduce a definition of a voluntary social label that is based on a price signal $\mathbf{p}(p_M, p_E)$ which informs consumers $i = 1, \dots, m$ about ethical production and

¹¹Note that e^l is not a quantity in \mathbb{R}^k as in the Lancaster model, but a descriptive list of characteristics. Hence, it should not be confused with the mathematical definition of a vector, i.e., the inner product operation does not apply. In essence e^l is a string of information.

distribution processes, and a class of ethically characterized commodities $\chi_i \in \mathcal{X}_i$, which further informs consumers descriptively about the way goods are produced.

Definition 2 (Voluntary social label). *A social label \mathfrak{G} is defined by a pair (\mathfrak{p}, χ_i^l) for $l = 1, \dots, n$ consisting of an ethical price system $\mathfrak{p} \in \mathcal{S}$ and commodity bundle $\chi_i \in \mathbb{R}^n$ characterized by a set of ethical standards e^l represented in words and symbols, which, is intended to inform consumers about ethical production and distribution standards. A consumer $i = 1, \dots, m$ who is informed by a social label \mathfrak{G} , i.e.,*

$$\mathfrak{G}_i := (\mathfrak{p}, \chi_i^l) \in \mathcal{S} \times \mathcal{X}_i$$

belongs to the class of ethical consumers.

A voluntary social label (\mathfrak{p}, χ_i^l) for all $l = 1, \dots, n$ consists of an ethical price and ethical conspicuous commodity pair. It belongs to the set of available labels $\mathcal{S} \times \mathcal{X}_i$ to consumer $i = 1, \dots, m$. For simplicity, we exclude non-voluntary labels in our model development without loss of generality. Definition 2 allows us to consider a group of informed consumers, where \mathfrak{G}_i represents that \mathfrak{G} is known to $i = 1, \dots, m$. These consumers have ethical preferences in the sense that they care about the way goods are produced and distributed. Consumers satisfying definition 2 are classified as ethical consumers. It remains to characterize their consumption behavior. We begin by motivating ethical consumption behavior.

Definition 3 (Conspicuous ethics). *Conspicuous ethics refers to an ethical consumption behavior where an informed consumer \mathfrak{G}_i , for $i = 1, \dots, n$, expresses superior ethical responsibility towards society relative to other members of society by purchasing ethically produced and distributed goods χ_i at ethical prices \mathfrak{p} . It is assumed that ethical consumers derive esteem from displaying their social responsibility through the consumption of ethically conspicuous goods. Positive ethical consumption is satisfied for all pairs*

$$(\mathfrak{p}, \chi_i) \in \mathfrak{G}_i.$$

An ethical consumer also expresses superior ethical responsibility towards society by boycotting the consumption of unethically produced and distributed goods. Negative ethical consumption is satisfied if

$$\text{either } p \neq \mathfrak{p} \text{ or } \chi_i \neq \chi_i.$$

Ethical consumers base their consumption decisions on the basis of ethical values, such as human rights, environmentally friendly and sustainable production, and animal well-being. We hypothesize that they express moral superiority towards

society via positive and negative consumption of ethical conspicuous goods. We consider ethical consumers who derive esteem from the consumption of “more expensive” ethical conspicuous goods. This relates our model to Veblen (1899) who discusses the evolution of society based on the competition of esteem. Veblen, however, assumes that consumers maximize utility and lacks a definition of an esteem function. Veblen introduces price dependent preferences. This, on the other hand, is similar to our model. However, the motivation is different.

We characterize the consumer’s preference ordering \succeq_q by an ethical price index q associated with an ethical market price price \mathbf{p} . It is assumed that the price depending preference ordering \succeq_q is unaffected by a proportional change in all prices \mathbf{p} (Pollak (1977)). Moreover, we consider normalized prices q , hence, our characterization of the consumer preference is at variance to Kalman, who assumes a preference ordering of the form \succeq_p over a consumption-market price space $(x, p) \in \mathbb{R}_+^n \times \mathbb{R}_{++}^n$, where x is a commodity bundle (Kalman (1968): A.1, p.498).

We want to represent preferences, which do not only depend on ethical consumption bundles but also on relative prices, which inform consumers about the way goods are produced. We are going to consider utility functions of the form $u_i(\chi_i, q)$. Let the open normalized price simplex be denoted by

$$\mathbb{S} := \{\mathbf{p} \in \mathbb{R}_{++}^n : \sum_{k=1}^n \mathbf{p}^k = 1\}, \quad (3)$$

with its closure simplex defined by

$$\bar{\mathbb{S}} := \{\mathbf{p} \in \mathbb{R}_+^n : \sum_{k=1}^n \mathbf{p}^k = 1\}. \quad (4)$$

We now formalize the hypothesis that consumers do not only have preferences for the physical properties of goods, but they also care about the way goods are produced. Hence by (2) and (4) we defined a preference relation of the form $\succeq_{(q, \chi)}$ over the preference ordering space $(q, \chi_i) \in \bar{\mathbb{S}} \times \mathcal{X}_i$, where

$$u_i : \bar{\mathbb{S}} \times \mathcal{X}_i \rightarrow \mathbb{R} \quad (5)$$

is the price-dependent ethical utility function. Stiefenhofer (2019) establishes the geometric conditions of smooth ethical utility functions. We can now formulate an ethical consumption model, where production is implicitly formulated through a reallocation of initial endowments. Let an ethical consumer $i = 1, \dots, m$ be endowed with a vector of initial endowments $\omega_i|_e = (\omega_i^1|_{e^1}, \dots, \omega_i^n|_{e^n}) \in \Omega_i|_e \subseteq \mathbb{R}_{++}^n$. We

denote $\omega_i|_e$ by ω_i and $\Omega_i|_e$ by Ω_i ¹².

Model I: Consider a group of informed consumers \mathfrak{G}_i , for $i = 1, \dots, m$ satisfying definition 2. Let an ethical consumer $i = 1, \dots, m$ be endowed with a vector of initial endowments $\omega_i \in \Omega_i$, and let his set of feasible consumption allocations be defined by $\mathcal{B}_i(\mathbf{p}, \omega_i) := \{(\mathbf{p}, \chi_i) \in \mathcal{S} \times \mathcal{X}_i : \mathbf{p} \cdot \chi_i \leq \mathbf{p} \cdot \omega_i\}$. Then for any given relative price system $q \in \mathbb{S}$ (ethical price index), ethical market price system $\mathbf{p} \in \mathcal{S}$, and ethical conspicuous goods $\chi_i \in \mathfrak{G}_i$ satisfying definition 1 the objective of the consumer is defined by

$$\arg \max_{\chi_i \in \mathcal{B}_i(\mathbf{p}, \omega_i)} u_i(\chi_i; q) \quad (6)$$

for every $i = 1, 2, \dots, m$. By definitions 1 and 3 ethical consumers consider the pair $(\mathbf{p}, \chi_i) \in \mathfrak{G}_i$ in their consumption decision. Other consumption bundles are boycotted, since they do not belong to the set of ethically produced goods. In addition consumption must also satisfy the wealth constraint $\chi_i \in \mathcal{B}_i(\mathbf{p}, \omega_i)$. The disentanglement of the price system into a price index q which enters the utility function and a price system \mathbf{p} which enters the budget constraint is a distinct property of our model. The semicolon in the utility function indicates that the price index q is considered as a parameter. This is very desirable because it can be estimated empirically¹³.

This model, although very simple, captures two key elements of ethical consumption. (i) Consumption is restricted to the consumption of ethically produced goods as indicated by the social label \mathfrak{G}_i , and (ii) the utility of the consumer depends on some price index q , which, further informs the consumer about ethically produced goods. Model I provided by (6) is obviously a stylized model and the relation between the ethical price system \mathbf{p} and the price index q needs to be established in more detail since the observed market price \mathbf{p} informs the consumer. Nevertheless, it allows us to show the following result:

Proposition 1. *Consider the class of log-linear utility functions. Then*

$$\arg \max_{\chi_i \in \mathcal{B}_i(\mathbf{p}, \omega_i|_e)} u_i(\chi_i; q) \iff \arg \max_{x_i \in \mathcal{B}(p, \omega_i)} u_i(x_i). \quad (7)$$

Proof. Let $x_i = \chi_i$ be the same commodity bundle for $x_i \in \mathbb{X}_i \subseteq \mathbb{R}_{++}^n$. Then $x_i \in \Omega_i|_e$. Let $u(x_i)$ be a Cobb-Douglas function with parameters $\alpha_j > 0$ and $\sum_{j=1}^n \alpha_j = 1$. It is well known that for any $(p, \omega_i) \in \mathcal{S} \times \mathbb{R}_{++}$, where $\omega_i \in \mathbb{R}_{++}$ is the consumer's wealth as defined by $p \cdot \omega_i$ with $\omega_i \in \Omega_i|_e$, this problem has a

¹²We do not intend to explicitly model ethical production in this paper. We are, however, aware that this is another interesting problem.

¹³The parameter q characterizes how an indifference map is placed into the consumption space.

unique solution $\phi_i(p, w_i)$ under the usual strict concavity assumptions of $u_i(\cdot)$. Its map is given by

$$\phi_i : \mathcal{S} \times \mathbb{R}_{++} \rightarrow \mathbb{R}_{++}^n,$$

which is homogeneous of degree zero. Now, with the price vector $q \in \mathbb{S}$ being kept fixed, and by defining $q_l = \alpha_l$ for $l = 1, \dots, n$ such that $q_l > 0$ and $\sum_{l=1}^n q_l = 1$ it follows, by the usual arguments, that the consumer's maximization problem has a unique solution $\xi_i(q, p, w_i)$ for any $(p, w_i) \in \mathcal{S} \times \mathbb{R}_{++}$ and $q \in \mathbb{S}$, which is called the extended demand function of the standard demand function. Its map is given by

$$\xi_i = \mathbb{S} \times (\mathcal{S} \times \mathbb{R}_{++}) \rightarrow \mathbb{R}_{++}^n,$$

which is homogeneous of degree zero. Moreover, it can easily be shown that for the class of utility functions considered here, the price dependent utility function $u(\cdot; q)$ is homogeneous of degree zero. \square

Proposition 1 states the conditions of how we can relate the ethical consumption model to the standard consumer model and therewith suggesting that parameters entering the utility of the ethical consumer can easily be estimated empirically. However, we yet need to establish the assumptions in our model which permit the positive relationship between quantity demanded and the price of an ethical commodity satisfying the conditions outlined in definition 3. For that purpose, we next provide two further generalizations of the basic model:

- (i) We endogenize the disentangled price system.
- (ii) We introduce a strictly monotone increasing real valued function representing some of the desired qualities of definition 3.

Considering (i) we define:

Definition 4. *The disentanglement of the ethical commodity market price \mathbf{p} into a price index q is given by a map*

$$s : \mathcal{S} \rightarrow \mathbb{S} \tag{8}$$

defined by $s(\mathbf{p}) := \frac{\mathbf{p}^k}{\sum_{k=1}^n \mathbf{p}^k}$ for $k = 1, \dots, n$.

We now consider a characterization of the consumer's preferences for ethically produced goods based on the market price \mathbf{p} . Using definitions 1,3 and 4 we extend our basic model of ethical consumption to obtain:

Model II: Consider a group of informed consumers \mathfrak{G}_i , for $i = 1, \dots, m$ satisfying definition 2. Let an ethical consumer $i = 1, \dots, m$ be endowed with a vector of initial endowments $\omega_i \in \Omega_i$, and let his set of feasible consumption allocations be defined by $\mathcal{B}_i(\mathbf{p}, \omega_i) := \{(\mathbf{p}, \chi_i) \in \mathcal{S} \times \mathcal{X}_i : \mathbf{p} \cdot \chi_i \leq \mathbf{p} \cdot \omega_i\}$. Then for any given relative price system $q \in \mathbb{S}$ satisfying definition 4 (ethical price index), ethical market price system $\mathbf{p} \in \mathcal{S}$, and ethical conspicuous goods $\chi_i \in \mathfrak{G}_i$ satisfying definition 1 the objective of the consumer is defined by

$$\arg \max_{\chi_i \in \mathcal{B}_i(\mathbf{p}, \omega_i)} u_i(\chi_i; s(\mathbf{p})). \quad (9)$$

Proposition 2. Consider the class of log-linear utility functions. Then

$$\arg \max_{\chi_i \in \mathcal{B}_i(\mathbf{p}, \omega_i)} u_i(\chi_i|_e; q) \iff \arg \max_{\chi_i \in \mathcal{B}_i(\mathbf{p}, \omega_i)} u_i(\chi_i|_e; s(\mathbf{p})). \quad (10)$$

Proof. Recall that $u_i(\chi_i; q)$ is homogeneous of degree zero. Then, using definition (4) it follows that $u_i(\chi_i; s(\mathbf{p}))$ is also homogeneous of degree zero. Note that the extended demand mapping

$$\xi_i = \mathbb{S} \times (\mathcal{S} \times \mathbb{R}_{++}) \rightarrow \mathbb{R}_{++}^n,$$

reduces to

$$\phi_i : \mathcal{S} \times \mathbb{R}_{++} \rightarrow \mathbb{R}_{++}^n,$$

which turns out to be the same demand function as the standard consumer model. \square

From propositions 1 and 2 we obtain the following corollary.

Corollary 1.

$$\arg \max_{\chi_i \in \mathcal{B}_i(\mathbf{p}, \omega_i)} u_i(\chi_i) \iff \arg \max_{\chi_i \in \mathcal{B}_i(\mathbf{p}, \omega_i)} u_i(\chi_i|_e; q) \iff \arg \max_{\chi_i \in \mathcal{B}_i(\mathbf{p}, \omega_i)} u_i(\chi_i|_e; s(\mathbf{p})).$$

Before explicitly introducing generalization (ii) above we introduce a general set of axioms on ethical preferences. In what follows we do not restrict our ethical consumer model to log-linear utility functions. We do now establish the assumptions of rational ethical consumption behavior.

Assumption 1 (Ethical preferences).

- a) (i) For all $x|_{e,p}, y|_{e,p}$, either $x|_e \succeq_p y|_e$ or $y|_e \succeq_p x|_e$. (ii) $x|_{e,p}, y|_{e,p}, z|_{e,p}$ with $x|_{e,p} \neq z|_{e,p}$ implies $\alpha x|_e + (1 - \alpha)y|_e \succ_p y|_e$ for $0 < \alpha < 1$. (iii) The preference relation \succeq_p is continuous in $x|_e$ and $\mathbf{p} \in \mathcal{S}$. (non-transitivity, Sonnenschein (1971)).
- b) If $x|_e \succeq_p y|_e$ then $x|_e \succeq_{p,\lambda} y|_e$ for all $\lambda > 0$, (preference orderings depend on relative prices).
- c) (i) $x|_e \succ_p y|_e \Rightarrow x|_e \succ_{p_{FT}^*} y|_e$, and (ii) $x|_e \sim_p y|_e \Rightarrow x|_e \succeq_{p_{FT}^*} y|_e$ (non-negative price effect on preferences).

(a) (iii) Similarly to Sonnenschein (1971) we introduce the concept of price-continuous preferences. We follow Sonnenschein's approach, which, together with a strict convexity assumption (ii) and a completeness assumption (i) on the price dependent preference relation is sufficient to establish rational behavior in the consumption space \mathcal{X}_i . Hence, in our model of ethical consumption, we are able to dispense of the usual transitivity condition. (b) states that preferences depend on a relative price system. This is at variance to Kalman (1968). However, a similar condition with its welfare implications is also discussed in Pollak (1977). (c) is a very specific assumption which allows modeling of conspicuous consumption of ethically produced goods. It allows for a positive correlation between prices and demand for ethical consumption goods and the boycott of unethically produced goods. In particular, assumption set 1, together with definition 3 leads to the following assumption.

Assumption 2. Let $E : \mathbb{R} \times \mathcal{S} \rightarrow \mathbb{R}$ be a monotone increasing real valued function satisfying $E \in \mathbb{R}_{++}$ for all $p \geq p_{min}$, and $E = 0$ for all $p < p_{min}$.

We are now in a position to formalize generalization (ii) above and to introduce the full ethical consumer model. Building on model II and applying assumption 2 yields a strict monotone transformation of the utility function $u_i : \mathcal{S} \times \mathbb{R}_{++} \rightarrow \mathbb{R}_{++}$ defined by $\hat{u}_i := u_i(x_i|_e; \mathbf{p}, s(\mathbf{p}))$. The assumptions 1 allow us to model a social label \mathfrak{S}_i as introduced in definition 2 in the utility of the ethical consumer. First, we observe that by the characterization of consumption goods through the characterization of \mathcal{X} ethical values enter the utility of the consumer through a characterization of ethical preferences distributed over an ethical consumption space. Second, the price signal provided by the ethical market price \mathbf{p} enters the utility of the consumer through the assumption on the preference relation allowing for the positive correlation between the ethical price signal and demand for ethical consumption goods. Let's introduce **Model III**.

Definition 5 (The ethical consumer model). Consider a group of informed consumers \mathfrak{G}_i , for $i = 1, \dots, m$ satisfying definition 2. Let an ethical consumer $i = 1, \dots, m$ be endowed with a vector of initial endowments $\omega_i \in \Omega_i$, and let his set of feasible consumption allocations be defined by $\mathcal{B}_i(\mathbf{p}, \omega_i) := \{(\mathbf{p}, \chi_i) \in \mathcal{S} \times \mathbb{R}_+^n : \mathbf{p} \cdot \chi_i \leq \mathbf{p} \cdot \omega_i\}$. Then for any ethical market price system $\mathbf{p} \in \mathcal{S}$ and price disentanglement $s(\mathbf{p})$ into an ethical price index q given in definition 4, and $E_i(p)$ satisfying definition 2, the objective of the consumer is formalized as

$$\arg \max_{\chi_i \in \mathcal{B}_i(\mathbf{p}, \omega_i)} E_i(u_i(\chi_i; s(\mathbf{p}), \mathbf{p})). \quad (11)$$

Lemma 1. The indifference set $\mathcal{I}(\sim_{\mathbf{p}}) := \{(x|_{\mathbf{p}}, y|_{\mathbf{p}}) \in \mathbb{X} \times \mathbb{S} : x \succeq_{\mathbf{p}} y \cap y \succeq_{\mathbf{p}} x\}$, where $\mathbb{X} \subseteq \mathbb{R}_+^n \times \mathbb{R}_+^n$ is closed.

From now, we abuse notation a bit. We assume that prices and ethically characterized goods are understood from the context.

Proof. We decompose the indifference set \mathcal{I} into the two sets $A(\succeq_{\mathbf{p}})$ and $A(\preceq_{\mathbf{p}})$ where

$$A(\succeq_{\mathbf{p}}) := \{(x|_{\mathbf{p}}, y|_{\mathbf{p}}) \in \mathbb{X} \times \mathbb{S} : x \succeq_{\mathbf{p}} y\}$$

is a consumption bundle pair allocation set associated with the price dependent preference relation $\succeq_{\mathbf{p}}$ and similarly

$$A(\preceq_{\mathbf{p}}) := \{(x|_{\mathbf{p}}, y|_{\mathbf{p}}) \in \mathbb{X} \times \mathbb{S} : x \preceq_{\mathbf{p}} y\}$$

is associated with the price dependent preference $\preceq_{\mathbf{p}}$.

Step 1: Pick any point $(\hat{x}|_{\mathbf{p}}, \hat{y}|_{\mathbf{p}})$ not in $A(\succeq_{\mathbf{p}})$. Then there is a set

$$B(\succ_{\mathbf{p}}) := \{(x|_{\mathbf{p}}, y|_{\mathbf{p}}) \in \mathbb{X} \times \mathbb{S} : y \succeq_{\mathbf{p}} x \cap x \not\succeq_{\mathbf{p}} y\}$$

and a set

$$\hat{B}(\succ_{\mathbf{p}}) := \{y|_{\mathbf{p}} \in \mathbb{R}_+^n \times \mathbb{S} : y \succeq_{\mathbf{p}} x \cap x \not\succeq_{\mathbf{p}} y\}$$

associated with $\succeq_{\mathbf{p}}$ such that $\hat{y}|_{\mathbf{p}} \in \hat{B}(\succ_{\mathbf{p}})$. By openness of the set $\hat{B}(\succ_{\mathbf{p}})$ we can construct a neighborhood $\mathcal{B}_{(\hat{y}|_{\mathbf{p}}, \varepsilon)} = \{y|_{\mathbf{p}} : \|y|_{\mathbf{p}} - \hat{y}|_{\mathbf{p}}\| \leq \varepsilon\}$ for small $\varepsilon \in \mathbb{R}_{++}$. By Blaschke's theorems (p.113-117, Blaschke (1949)), we now show that $\mathcal{B}_{(\hat{y}|_{\mathbf{p}}, \varepsilon)}$ is the largest set contained in some finite convex set in $\hat{B}(\succ_{\mathbf{p}})$. The theorems imply a construction of a regularized convex set in $\hat{B}(\succ_{\mathbf{p}})$ by

$$\text{Conv}(f_1(y|_{\mathbf{p}}^1), \dots, f_m(y|_{\mathbf{p}}^m)) = \left\{ \sum_{i=1}^m \lambda^i f_i(y|_{\mathbf{p}}^i) : \lambda^i \geq 0, \sum_i \lambda_i = 1 \right\}$$

where f is smooth and convex function with the image of $\sum_i^m f_i$ complete. Blaschke's rolling theorems then imply there exists a largest $S \subset \text{Conv}(f_1(y|_p^1), \dots, f_m(y|_p^m))$ with radius $r = (\sup k)^{-1}$ where k is the curvature such that $k(S) < k(\text{Conv}(f_1(y|_p^1), \dots, f_m(y|_p^m)))$ at some point P . Hence we choose $\varepsilon \leq r$ and obtain

$$\mathcal{B}_{(\hat{y}|_p, \varepsilon)} \subset S_y \subset \hat{B}(\succ_p)$$

For each i we have that $f_i(y|_p^i) \in \{y|_p \in \mathbb{R}_+^n \times \mathbb{S} : y \succeq_p \hat{x} \cap \hat{x} \not\prec_p y\}$. Alternatively we have that $\hat{x}|_p$ belongs to an open set $C(\prec_p) = \{x|_p \in \mathbb{R}_+^n \times \mathbb{S} : f_i(y|_p^i) \succ_p \hat{x}\}$. Then for each i we construct a neighborhood $\mathcal{B}_{(\hat{x}|_p, \varepsilon)}^i = \{x|_p : \|x|_p - \hat{x}|_p\| \leq \varepsilon\}$ with center $\hat{x}|_p$ and radius $\varepsilon \in \mathbb{R}_{++}$. By a similar construction as above using Blaschke's rolling theorems and $\bigcap_{i=1}^m \mathcal{B}_{(\hat{x}|_p, \varepsilon)}^i = \mathcal{B}_{(\hat{x}|_p, \varepsilon)}$ we obtain for all i

$$\hat{x}|_p \in \mathcal{B}_{(\hat{x}|_p, \varepsilon)} \subset \mathcal{B}_{(\hat{x}|_p, \varepsilon)}^i \subset S_x \subset C(\prec_p),$$

which shows that for each i we have that $f_i(y|_p^i) \in \hat{B}(\succ_p)$ by the strict convexity assumption. We construct

$$\mathcal{B}(\hat{x}|_p, \hat{y}|_p) = \mathcal{B}_{(\hat{x}|_p, \varepsilon)} \times \mathcal{B}_{(\hat{y}|_p, \varepsilon)}.$$

Consider any pair $(x|_p, y|_p) \in \mathcal{B}(\hat{x}|_p, \hat{y}|_p)$ the from above, we have that $\hat{y}|_p \in \mathcal{B}_{(\hat{y}|_p, \varepsilon)} \subset \hat{B}(\succ_p)$ and thus x, y is not in $A(\succeq_p)$. It follows that $\mathcal{B}(\hat{x}|_p, \hat{y}|_p)$ do not satisfy \succeq_p . Need to show the opposite relation. This follows from a similar analysis as above. Since A and B are closed sets it follows that its intersection \mathcal{I} is also closed. This completes the proof. \square

Theorem 3 (Existence of an esteem function). *Let assumptions 1 and 2 hold. There exists a continuous price dependent esteem function $E_i : \mathcal{S} \times \mathbb{R}_{++}^n \rightarrow \mathbb{R}$, for all $(\mathbf{p}, \chi_i) \in \mathfrak{G}_i$ and $i = 1, \dots, m$, such that if $\chi_i^* \in \mathcal{B}_i(\mathbf{p}, w_i)$, then $u_i(\mathbf{p}, \chi_i^*) = \max u_i(\mathbf{p}, \chi_i)$ if and only if $\chi_i^* = f(\mathbf{p}, s(\mathbf{p}), w_i)$, where f is derived from $R(\mathbf{p})$.*

Proof. Step 1 We show that there exists a continuous mapping $k : \mathbb{X} \rightarrow \mathbb{R}$ derived from the preference relation \succeq_p .

Let $\mathbb{X} := \mathbb{R}_+^n \times \mathbb{R}_+^n \times \mathbb{S}$ be a Banach space equipped with a quasi metric $d(x|_p, y|_p) := \frac{y|_p}{\|y|_p\|} \|x|_p, y|_p\|$. A consumer is indifferent for all points $\mathcal{I} := R(\mathbf{p}) \cap R^{-1}(\mathbf{p})$. We now define

$$m(x|_p, y|_p) := (x|_p, y|_p) \in \arg \min_{\frac{y|_p}{\|y|_p\|}} \|(x|_p, y|_p), (z|_p, w|_p)\| \text{ for all } (z|_p, w|_p) \in \mathcal{I}. \quad (12)$$

$m(x|_p, y|_p)$ is continuous since \mathcal{I} is a closed set. Closedness of \mathcal{I} follows immediately from the continuity and closedness of $R(\mathbf{p})$ and $R^{-1}(\mathbf{p})$. Hence defining

$$k(x|_p, y|_p) = m(x|_p, y|_p)$$

it follows that the mapping k is continuous. Moreover, it holds that for all $(x|_p, y|_p) \in \mathbb{X} \setminus \mathcal{I}$

$$k(x|_p, y|_p) \neq 0.$$

(i) To show that $k(x|_p, y|_p) > 0$ we only need to restrict equation (12) to point $x|_p \in P(y)$. (ii) To show that $k(x|_p, y|_p) < 0$ we only need to restrict equation (12) to point $y|_p \in P(x)$. (iii) It follows that the restriction of equation (12) for all points $(x|_p, y|_p)$ not in $P(y) \times P(x)$ implies that

$$k(x|_p, y|_p) = 0.$$

Hence this holds for all $(x|_p, y|_p) \in \mathcal{I}$. (iv) We need to show that equation (12) is a quasi metric. Hence, we translate the original coordinate system through the point $x|_p$ such that under the translation $x|_p$ is a null vector. Then it follows that equation (12) generates negative values since $\frac{y|_p}{\|y|_p\|} = -1$.

Step 2 We show that a continuous parameterized utility function exists and that the model of the consumer is well defined. Denote by $B_i = \{x|_p \in \mathbb{R}_+^n \times \mathbb{S} : \mathbf{p} \cdot x|_p \leq w_i\}$ the consumer's set of feasible consumption allocations. Define

$$u(x|_p; s(\mathbf{p})) := \min_{y|_p \in B} k(x|_p, y|_p) \quad (13)$$

By continuity of k and the construction of B_i it follows that u is continuous. We can now formulate the model of the consumer.

We need to show that if $x|_p^* \in B_i(\mathbf{p})$, then $u_i(x|_p^*; s(\mathbf{p})) = \max u_i(x, x|_p)$ if and only if $x|_p^* = f(\mathbf{p}; s(\mathbf{p}), w_i)$. Suppose that $x|_p^* = f(\mathbf{p}; s(\mathbf{p}), w_i)$. Then it holds that $k(x|_p^*, y|_p) \geq 0$ for all $y|_p \in B_i(\mathbf{p})$ by step 1. By definition 13 we obtain

$$u(x|_p^*; s(\mathbf{p})) := \min_{y|_p \in B} k(x|_p^*, y|_p) = 0$$

for all $y|_p = x|_p^*$ since $k(x|_p^*, x|_p^*) = 0$ by step 1. On contrary $x|_p^*$ maximizes $u_i(x|_p; s(\mathbf{p}))$ for all $x|_p \in B(\mathbf{p})$ since

$$u(x|_p; s(\mathbf{p})) := \min_{y|_p \in B} k(x|_p, y|_p) = k(x|_p, x|_p) = 0.$$

Suppose $u(x|_p^*; s(\mathbf{p})) = \max_{x \in B(\mathbf{p})} u(x|_p; s(\mathbf{p}))$ and that $x|_p^* \in B(\mathbf{p})$. We will show that $x|_p^* = x|_p^{**}$, assuming that $x|_p^{**} = f(\mathbf{p}; s(\mathbf{p}), w_i)$. From above, since $x|_p^{**} = f(p; s(p), m)$, we have that

$$u(x|_p^{**}; s(\mathbf{p})) = \max_{x \in B(\mathbf{p})} u(x|_p^*; s(\mathbf{p})) = u(x|_p; s(\mathbf{p})) = 0.$$

It then follows that $k(x|_p^*, y|_p) \geq 0$ for each $y|_p \in B(\mathbf{p})$ and $k(x|_p^{**}, y|_p) \geq 0$ for each $y|_p \in B(\mathbf{p})$. This can be reformulated as $x|_p^* \in R(y)$ and $x|_p^{**} \in R(y)$ for each $y|_p \in B(\mathbf{p})$ so that both $x|_p^*$ and $x|_p^{**}$ satisfy the definition of $f(\mathbf{p}; s(\mathbf{p}), w_i)$. Hence $x|_p^* = x|_p^{**}$.

Step 3 The existence of a demand function follows with little algebraic manipulation Debreu (1972). The derivation of the demand function is available from the authors upon request. □

4 Conclusion

In this paper we contribute to the theoretical literature on ethical consumption by extending the standard consumer model to ethical preferences, leading to a logically consistent model of positive and negative ethical consumption behavior. We have shown that the standard consumer model lacks the necessary structure to deal with complex empirically observed ethical consumption properties. Alternative theories, such as those based on intrinsic properties of commodities, are shown to exhibit logical inconsistencies when ethical values enter the model.

We propose a model of conspicuous ethics. In this model, consumers are not utility maximizers in the usual sense, but compete for esteem relative to other members in society. For that purpose, we define a framework in which society evolves through the consumption of ethical conspicuous goods. We formulate a model of esteem maximization, where esteem is derived from displaying moral superiority towards society through the consumption of ethical conspicuous goods. Ethical consumers belong to a class of informed consumers who retrieve information via social labeling. Their consumption choices are informed by social labels and ethical price systems which do not only perform the role of efficient resource allocations but also inform consumers about the way goods are produced and distributed.

Avenues for future research could empirically investigate the role of prices in modeling ethical values. This requires investigating the price disentanglement discussed in this paper, where the price index entering the preference relation represents the ethical behavioral component of the consumer's purchasing decisions.

Seminal work in this direction could initially take place within an experimental setting. The experiment should also isolate the effects that social labels have on the preference relation of the consumer. This requires extracting ethical information contained in the descriptive characterization of the commodities. The two results would enable the authors to derive a topology of ethical consumption and therewith establish a path for field experiments and empirical work.

We hypothesize that ethical consumers derive esteem from displaying superior moral responsibility towards society by purchasing the more expensive ethically produced goods. The objective of esteem maximization implies that ethical consumers compete for moral esteem by displaying their consumption activities towards other members of society. Conspicuous ethical consumption behavior is modeled by an esteem function $E(u(\cdot, p), p)$ which is conceptually different from a utility function. The esteem function permits individuals to neglect consumption of non-ethically produced goods. Equally importantly, it also permits consumers to neglect consumption if certain price conditions are not met. The assumption of conspicuous ethical consumption states that prices and demand for ethical commodities are positively correlated. Hence, the ethical consumer model leads to demand functions, which do not adhere to the usual law of demand. Moreover, demand functions are discontinuous as a consequence of the role prices play in the esteem functions. These two properties lead to interesting welfare implications that should be investigated in the context of a generalized Slutsky equation in future work.

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