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Collect now—consume later on innovative products in electronic commerce

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Abstract

In our paper, we develop the idea that in the future electronic commerce will increasingly involve customers whose lack of time for consumption forces them to collect the products they purchase for later consumption. The peculiarity of these conditions at the point of sale will be discussed in detail from the perspective of economic theory. The analysis will elaborate how certain characteristics of utility functions as well as other characteristics of this consumer segment contribute to these peculiarities. As a result some lessons for the timing of innovations in the supply of information commodities are derived. In particular, it is shown why it might be profitable for suppliers in electronic commerce to produce waves of technological fashions. From a theoretical point of view, it seems to be reasonable to use chaotic dynamics to describe this highly volatile market behavior.

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1. Introduction

Consumer behavior and its implications for the supply side have been studied extensively though from rather diverse perspectives in several sub-disciplines of economic theory.

Standard microeconomics lays its emphasis on the investigation of the logical implications of certain axiomatic assumptions on given preference orders. Though some of these implications have been tested by experimental economists—with varying results—

the thrust of theory building in this area remains in the realm of abstract theorems of decision logic (see e.g. Ref. [3]).

More *applied economic theory* of consumer behavior tended to differentiate between the different approaches that have been taken to study it (see e.g. Ref. [1]). In particular, a motivation approach, a single-concept approach, a grand theory approach, an information-processing approach, an affective approach and an experiential approach are distinguished and discussed by different scholars in the field. What is especially important in applied economic theory is that the demand side behavior of consumers is seen as part of an interdependent system which involves supply side actions and the development of macro-variables that feed back into micro-decisions too. Nevertheless applied economic

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theory—at least in its academic reputation—still suffers from the missing of some more unifying concepts that some researchers feel to be necessary to structure the existing set of aspects.

Finally research rooted in *managerial economics* has contributed to the study of consumer behavior. From the point of view of a single firm consumer behavior is of utmost importance for its marketing strategy (see e.g. Ref. [2]). Two ideas figure prominent in this literature. First, some products seem to follow a so-called *product cycle*, i.e. demand for these products emerges, grows and finally vanishes again. Second, demand can be influenced massively by the use of *information policy*, i.e. consumers use mental models to determine their product choices—and these models are open to manipulation. Managerial economics has also produced a more algorithmic view to describe consumer behavior as a sequence of actions, the so-called *stages of consumer buying behavior*: need identification, product brokering, merchant brokering, negotiation, purchase and delivery, product service and evaluation. This sequence is particularly useful to identify the place of a certain theoretical contribution in this sequence.

Given this largely diverse strands of theories of consumer behavior, what follows focusses on a special part of consumer–supplier interaction, a part that seems to be of particular interest for electronic commerce—and uses bits and pieces of the mentioned schools, wherever it seems to be appropriate. In this eclectic way, the next section uses microeconomic techniques to formulate something analogous to a product cycle, while the succeeding chapter lays emphasis on expectation formation to introduce demand–supply interaction. Finally some empirical evidence for the relevance of our model will be given.

As will be noted, our model in principle covers all stages of consumer buying behavior though it does not go into the details of brokering and negotiation. In this respect, our particular interest is the challenge to cope with a special type of needs and the reaction this type induces on the supply side.

2. Theory

We first characterize the group of consumers we want to describe in an informal way. Consumers in the

segment to be highlighted are characterized by the following specific features.

- The utility they derive from consumption consists of two, analytically distinctive future consumption periods: a period in the near future, called *immediate consumption*, and a period in the more distant future, called *latent consumption*.

- Immediate consumption is the part of consumption necessary to satisfy the needs of the physical metabolism of a consumer. It includes everything needed for *enduring physical and mental reproduction* of the consumption unit, i.e. eating, housing, clothes, services like job training, child care and the like.

- Latent consumption consists of those goods and services that are *not essential for immediate reproduction*. In what follows only those commodities for latent consumption that are *information commodities* are considered. The reason for narrowing the focus is the observation that due to electronic commerce the share of information commodities in latent consumption increases.

- *Information commodities* are commodities which can be represented as a bit string.

- Consumers are thought to be *rational and well organized* with respect to their *immediate consumption*. In particular, they are assumed to allocate time in the immediate future in a way that combines working time and immediate consumption time by the use of a schedule ensuring their metabolism.

- Assume further that *labour productivity* of the consumers in this segment *increases* while *immediate consumption* becomes *cheaper*. With fairly developed market mechanisms, this implies that for given working time more income becomes available than can be spent in the remaining time for immediate consumption. There is a clear limit of daily eating and drinking, and you cannot live in your house more than 24 hours a day. Even with some adjustment for quality of immediate consumption commodities, satisfaction levels are bound to be meat—this is the point where symbolic values emerge.

- *Excess income* is spent for latent consumption, in particular for latent consumption of information commodities.

- The utility attributed to latent consumption acquires the status of a *symbolic value*. It derives from the imbalance between the more intensive working time which is not balanced by an adequately

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