Discount Factor for Durable Goods: Evidence from the Spanish Automobile Market

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ABSTRACT

Incentives for car purchases have been a common concern for politicians in Spain. In this paper, the author wants to focus on two recent policies: Plan VIVE and Plan 2000e, introduced in 2008 and 2009 respectively. The data on car sales in Spain show that after the introduction of the Plan 2000e there was a significant increase in the number of vehicles sold in Spain. But that seems quite contradictory with the features of these plans: if one assumes an average consumer borrows money at a certain interest and repays it in several years, it can be seen that it is actually possible to save more money using the Plan VIVE rather than the Plan 2000e. The author provides evidence to support that the key to understand this puzzle is time preference: car purchase, as with many other durable goods, has a very strong intertemporal discount factor. The hypothesis is demonstrated by the fact that, at least in Spain, people prefer an initial lump-sum payment in order to purchase a car rather than a financial program with better conditions.

Keywords: Automobile, Behavioral Economics, Discount Factor, Durable Goods, Empirical Time Series, Time Preference

1. INTRODUCTION

Currently, the automobile industry is a key sector in most of the advanced countries; in many cases, this sector is actually one the biggest generator of both direct and indirect jobs. The production and sale of cars has thus became one of the highest contributors to the value added of the industrial sector in many countries as well as a major component of the GNP, capturing not only production but also R&D investment. Considering these facts, it is not surprising that politicians all around the world have been worried about the evolution of the car industry. Thus, in the last few decades, Governments in many countries have tried to boost domestic car sales especially during periods of economic recession. In some cases these policies have been implemented in an indirect way; for instance, by providing the public sector only domestically produced cars or by introducing barriers to the sale of foreign cars in the domestic market. But it is not a secret that in other cases these policies have directly tried to boost the sales by

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Introducing monetary incentives, as subsidies or tax reductions, on the demand side. However, in order to be successful, there are several relevant questions that policy makers should face before implementing these policies: how do potential buyers evaluate purchase decisions? Do they take into account all the possible elements prior to purchasing a durable good? Are they sure that one credit provides them with a more beneficial payments scheme with respect to another one? In summary, should we trust in the “rational consumer” model?

This paper presents a challenge to the “rational consumer” model; thus, following the trend that has begun in the last decades, we want to focus on the so-called behavioral elements. Among them, we want to study and evaluate the effect of the time preference associated with the purchase of cars, as a durable good. Of course this is not new: since Irving and Samuelson formalized this time preference element for the first time in the Thirties, many authors have tried to identify and empirically estimate this factor associated to the purchase of durable goods. For instance, Hausman (1979), who studies the market of air conditioners in the US, estimated a discount rate of 20% on the basis of the tradeoff between capital costs versus operating costs of such machines. Nevertheless he was aware of a considerable variation across different income levels of consumers. In a similar way, but based on the market of refrigerators, Gately (1980) estimation yields discount rates ranging from 45% to 300%. Some other authors have tried to identify the specific discount factor associated to car purchase. For example, Dreyfus and Viscusi (1995) examine the role of time preference factor—derived from fuel efficiency, operating costs and safety as mortality and injury—as it relates to consumers’ valuation of the fuel economy attributes of cars and the life and health effects of automobiles. Their estimation suggests a discount factor in between 11 and 17%. They conclude that such discount factor is consistent with the interest rate required for automobile purchase. Additionally, Verboven (1997) analyzes the intertemporal choice problem between a gasoline car versus a diesel car. He estimates an implicit discount factor, which tends to be positive but less than in other appliances. Another research study to take into account is the one conducted by Cohen (1998). Although the author carries out the analysis from a legal and juridical view, he recognizes that a decrease in the interest rate of payments for car loans is not capable to clearly incentivize the purchase of automobiles. He presents some facts and data to support this statement.

Nevertheless, the aforementioned studies, together with most of the earlier papers on time preference estimation, are subject to many problems. Frederick et al. (2002) point out issues such as the lack of information among consumers—that was pretty clear for the appliance case, since it is really difficult to estimate the tradeoff between cost savings of different appliances—and hidden costs of the most efficient appliances—reduced convenience or reliability—make the time preference estimations too noisy. In addition, Kurani and Turrentine (2004), as Frederick et al. (2002) do, argue that people generally have no idea about cost saving, so it is difficult to estimate a real time preference factor. Focused on the time preference associated to automobiles, Morton et al. (2011) indicate that the impact of search cost, incomplete information, and bargaining disinutility on the purchase of cars can also increase the noise of the time preference estimation. An argument that is also supported by Greene (1983), who provides additional evidence in the same direction.

Taking into account the previous arguments, being aware of the existence of informational burdens and transactions costs, and considering that previous literature has ignored them, we propose here a different scenario: what if the consumer is fully informed of the different alternatives in the market? In particular, once the consumer is aware of the existence of different payment schemes, and provided that she is fully informed about them—so she is able to compute easily the cost of each alternative—it seems that we still observe the existence of such a non-rational behavior. That is the case of
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