

Consumer willingness to pay for environmentally friendly distribution

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Many associate climate and environmental measures with large investments and high costs, but sustainable distribution does not necessarily have to be expensive solutions with low utility for the consumer. The analyses documented in this report show that many consumers want environmentally friendly distribution and their willingness to pay for such services is at the level of or higher than other shipping services such as delivery time slot and delivery location choice, but usually lower than the willingness to pay for fast delivery (same day or within a few hours of ordering). If willingness to pay is interpreted as utility, this may mean that many consumers will choose environmentally friendly deliveries if it is not urgent to receive the goods and does not come at the cost of an acceptable delivery time and price. This report contributes knowledge and advice for the development of environmentally friendly distribution solutions for the last mile.

Introduction

This report documents the results of a study of consumer willingness to pay for environmentally friendly last-mile distribution (hereafter referred to as distribution) of goods purchased online. The study is based on a literature review and analyses of data from a consumer survey conducted by the logistics operator PostNord. The aim has been to contribute to knowledge about what delivery solutions online retailers and carriers can offer to achieve climate and environmentally friendly distribution that is attractive to consumers. This provides insight that carriers and others can use to plan for the future of online shopping deliveries.

Methodology and Analysis

Two methods were used to gather information about consumer perceptions and willingness to pay for environmentally friendly distribution. A literature search was conducted in Science Direct, Google Scholar, and Web of Science to find research literature on willingness to pay for environmentally friendly distribution of goods purchased online. We also read reports from logistics companies and summaries of online shopping trends.

In addition to the literature review, we conducted simple analyses of data from PostNord's Online Shopping Barometer "Netthandelsundersøkelsen" which was conducted in May 2022



by the data collector Norstat. The purpose of the survey was to map consumer online shopping habits, preferences, and willingness to pay for various shipping services.

E-commerce and delivery services

The increasing trend of online shopping in Norway has resulted in a growing demand for delivery services. Delivery is a major source of greenhouse gas emissions and environmental impact in the value chain of online shopping. However, there are opportunities to reduce the environmental impact of delivery by using more efficient delivery methods such as consolidated deliveries, pick-up points, energy-efficient vehicles, and eco-friendly packaging. The success of these initiatives depends on consumer acceptance and willingness to pay for environmentally friendly delivery options. This study aims to investigate consumer attitudes towards environmentally friendly delivery, their willingness to pay for such delivery, and how they value the environment compared to other factors such as delivery costs, delivery time, and delivery timing. The study also aims to compare the results of the literature review with the findings of market surveys conducted by relevant players in the industry.

Environmentally friendly distribution

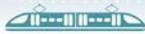
Among researchers, there has been particular interest in recent years in how cargo traffic from e-commerce can be reduced. This includes exploring whether consumers might be interested in contributing to more environmentally friendly distribution by choosing delivery options with slightly longer delivery times or paying for solutions with lower environmental and greenhouse gas emissions. The challenges of achieving environmentally friendly distribution are in conflict with free and fast delivery with flexible pick-up locations and pick-up times, which many studies show are the consumer's preferred distribution solution.

The literature review conducted and presented in this paper shows that environmentally friendly distribution is less important to the consumer than low price for transport, delivery time, and delivery location, but that consumers still want environmentally friendly transportation. Studies that investigate the willingness to pay for environmentally friendly distribution show a willingness to pay between 1-4 euros (this corresponds to 10-40 Norwegian kroner), depending on study area. The preferences vary with socio-demographic and economic conditions such as gender, age, education, income, and attitudes. The willingness to pay for environmentally friendly services seems to be on par with or slightly higher than for other shipping services such as information services, choice of delivery slot and delivery location, but lower than the willingness to pay for fast delivery (same day or within a few hours after ordering).

A well-thought-out and environmentally friendly standard solution that meets expectations around price, time, and flexibility in the relevant market, can be a good and attractive measure to nudge consumers towards more environmentally friendly options.

What about Norwegian consumers?

The surveys of Norwegian consumers conducted by PostNord and Bring Research support the main findings from the research literature: Price and flexibility are the most important delivery criteria for consumers, but many, especially young people and women, are concerned about the environment. In the summer of 2022, PostNord, in collaboration with Norstat, conducted a consumer survey, where they asked, among other things, which delivery options consumers prefer and their willingness to pay for selected delivery services. This survey has been more closely studied in this report, with emphasis on the questions about which delivery options are preferred when shopping online and the willingness to pay for various delivery services. We



found that over 50 % of the sample prefer the cheapest delivery option, while only 4 % prefer the environmentally friendly option. When it comes to willingness to pay, instant home delivery (within a few hours) has the highest average willingness to pay among both men and women. We interpret this as a service people choose when in need of the product very quickly and it provides a clear value to the recipient. The average willingness to pay for environmentally friendly transport with zero-emission vehicles is between 70 and 75 Norwegian kroner. There is a large variation in how much consumers are willing to pay for the various delivery services in the survey.

For a deeper understanding of willingness to pay for selected delivery services, we conducted simple econometric analyses to examine how willingness to pay for environmentally friendly transport (with zero-emission vehicles), willingness to pay for instant home delivery (within a few hours), and willingness to pay for home delivery (next day) vary with socio-demographic and economic factors. The main findings are that the models explain a very small part of the variation in willingness to pay, but that the following findings seem robust:

- Younger consumers (under 40 years of age) generally have a higher willingness to pay for all three delivery services than older consumers.
- Consumers with children under 15 years of age in the household have a higher willingness to pay for delivery services than those without children under 15 years of age in the household.
- A person's preferences related to last mile delivery when shopping online has a significant impact on willingness to pay for a delivery option.
- Estimated parameter values of gender, income, and frequency of online shopping are not significant and suggest that these variables have little impact on willingness to pay.
- There is a positive correlation between willingness to pay for fast home delivery within a few hours, home delivery next day, and environmentally friendly transport, indicating that some consumers are generally willing to pay for transport services, others not.

In summary, the findings from the estimation match well with the research literature in the field.

How to get consumers to choose sustainable deliveries?

The research literature and the carriers' own surveys show that many consumers are concerned about and want environmentally friendly deliveries from online shopping. Thus, online stores and carriers should work to establish environmentally friendly distribution solutions in the market. At the same time, it is a paradox that consumers say they want environmentally friendly distribution but end up choosing delivery solutions with short delivery times and low prices.

One way to interpret willingness to pay is as a utility, and further that consumers have a value of distribution solutions that are environmentally friendly and a theoretical willingness to pay for this. We can therefore expect them to choose environmentally friendly distribution when it is offered without or at low extra costs and is not exceeded by other, more attractive solutions such as free home delivery within a few hours. We discuss several measures that can stimulate consumers to choose environmentally friendly deliveries, but the most important tool seems to be that the consumer at checkout has the opportunity to choose environmentally friendly and attractive delivery solutions. This means that they do not cost too much or result in unreasonably long delivery times or are delivered to unattractive locations.



Conclusion

There seems to be a perception that distribution from online shopping (last-mile distribution) can only become environmentally friendly with the help of technological development and new, cleaner vehicles, because customers are only concerned with delivery solutions that provide the quickest possible delivery at the lowest possible price. Both the research literature and surveys conducted by the distributors confirm that customers are concerned about delivery time, price and where and when goods are delivered, but also care about environmentally friendly delivery solutions. There is even a willingness to pay for environmentally friendly distribution. A well-thought-out and environmentally friendly default solution that meets the expectations around price, time and flexibility in the relevant market can be a good and attractive measure to get consumers to choose more environmentally friendly. Some consumers might even be willing to pay for such services.