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TITLE: Local preferences for continued cruise ship tourism to Stavanger: A discrete choice experiment with attribute framing

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Summary

Despite a large body of research in tourism, relatively few focuses on the local populations' preferences for tourists. In a discrete choice experiment we measured peoples' level of acceptance in terms of peoples' willingness to pay (WTP) to avoid an increase in future cruise ship tourism to the downtown Stavanger area. We did not find that people on average have a clear preference for reducing future visits. By utilizing attribute framing we found indications that question framing affects peoples WTP. We did not find evidence to suggest exposure affects peoples' preferences for cruise ship tourism.

Table of Contents

Acknowledgements	ii
Summary.....	ii
1 Introduction	1
2 Literature review.....	4
3 Theory	7
3.1 Consumer theory	7
3.2 Externalities	8
3.3 Quality changes: equivalent and compensating surplus.....	11
3.4 Discrete choice experiment	14
3.5 Framing	15
3.6 Hypotheses	16
4 Method	17
4.1 Design of the Discrete Choice Experiment.....	17
4.2 The Survey Implementation.....	20
5 Econometric model	23
6 Results.....	25
6.1 Main estimation results	28
6.1.1 Willingness to Pay.....	30
6.2 Exploring Preference Heterogeneity.....	32
7 Discussion.....	35
7.1 Limitations	36
8 Conclusion.....	37
9 References	39
Appendices	45
Appendix 1 – Example of the choice sets presented to survey respondents.....	45
Appendix 2 – Example of the survey as presented to respondents.....	47

Table of Figures

Figure 1: Negative externalities in production 9
Figure 2: Positive externalities in consumption 10
Figure 3: Compensating surplus and WTA 12
Figure 4: Equivalent surplus and WTP 13
Figure 5: Example of choice card presented to respondents 20

List of Tables

Table 1: Monetary measures for environmental quality changes 11
Table 2: Levels and attributes 17
Table 3: Background demographics 26
Table 4: Estimation results 29
Table 5: Willingness to pay 31
Table 6: Interaction effects 33

1 Introduction

Understanding residents' attitudes towards the cruise tourism industry is vital to ensure its future success and sustainability in the region. The cruise ship traffic is predicted to continue to increase from its already record breaking levels (Dybedal, Farstad, Winther, & Landa-Mata, 2018; Jupskås, 2019), rising more than 30% from 2018 to 2019 in Stavanger (Jupskås, 2019), and predicted to reach around 2,25 million cruise tourists nationally by 2060 (Dybedal et al., 2018). There has been a vigorous defense of the industry from some of the interested parties, mainly more economically conservative parties, but also cruise companies, local tourism boards and port authorities. Even though most coverage so far in the popular press have been somewhat positive towards the industry and its proposed benefit to the regions affected by it, some are however more concerned with the issues concerning the cruise sector. The west coast of Norway is a popular destination with cruise ship tourists, with the port of Stavanger being host to 234 ships and 454 000 passengers in 2019 (Stavangerregionen Havn IKS, 2020). Tourism authorities and the cruise ship providers are happy to report this as good news to the press and locals without raising further issues. The good news being that they estimate the economic benefit to the region in excess of 320 million NOK in Stavanger, which would imply that every tourist leaves around 700 NOK in the region during their visit. However, studies are inconclusive about the actual amounts (Dybedal, 2019; Larsen, Wolff, Marnburg, & Øgaard, 2013). With some studies finding that other forms of tourism bring in more revenue to the region and that cruise tourists might in fact be the types of tourists that spend the least amount (Larsen & Wolff, 2016; Larsen et al., 2013).

Yet as studies have focused on the economic impact, others have focused on the preferences of cruise ship passengers, trying to figure out what they want to spend their money on and the experiences they demand from their purchase. Some studies have looked at the environmental impact, or simply how the extra number of people contribute to the social life in the city. The cruise ship industry has also received some negative coverage recently especially in the recent local elections where some of the parties explicitly indicated they would seek to restrict future traffic.

With the information that currently is available, there are however some important gaps. While there are several informal opinion polls about how residents perceive the cruise ship

industry, and some studies related to the issue, these are mostly either too informal or not well conducted to say something specific about local preferences. Opinion polls are hardly a scientific method to conduct such studies, and the only one conducted in the area was made by request from a political party negative to the industry. Some studies that have been conducted have focused on a stated preference approach, where the respondents are asked directly how they perceive the cruise ship industry, mostly finding a correlation between positivity to the industry and how many people you know directly benefitting from it. It seems therefore that studies on residents' preferences for cruise ship tourism is scarce, most of the available research focuses on the cruise ship tourists' preferences, their economic contribution and the environmental impact from the industry. We will therefore take a more systematical approach to investigate local preferences for continued traffic and see how certain attributes are valued. Instead of just looking at the preferences for traffic itself, we will try to identify the attributes that influence these attitudes.

Our goal for this research is therefore to see if the residents of Stavanger has a preference to change the level of cruise tourism in the city. Specifically, we want to see if the residents are willing to pay to reduce traffic to the area. We also want to see how preferences might be different depending on how the level of cruise tourism is defined in our questionnaire. This is often referred to as question framing or signposting, and we will implement this as either a question about the number of cruise ships, or the number of cruise tourists annually. Additionally, we want to see if there are any different preferences in the population based on their demographic backgrounds, e.g. gender, age or income.

Cruise ship tourism to downtown Stavanger affects the residents there because downtown recreation is a complex multi-attribute public good. Everyone has access to downtown, but someone else being there might affect how you personally perceive your stay there, and your ability to complete your desired activities. Describing the utility gained from such a public good can be difficult, since the various attributes can be hard to define on their own. We can also not elicit someone's preferences for other outcomes as they are purely theoretical, meaning, someone's preferences today might be defined through revealed preference (RP), but trying to figure out how people prefer future tourism traffic to the area is not possible through RP data. Therefore, to discover people's preferences for future traffic you must design a stated preference (SP) experiment, and since downtown recreation is a multi-attribute good, we

need a SP experiment which can deal with such a good. We have designed a discrete choice experiment (DCE) which we have administered to the population in Stavanger through an online survey. We wanted to see if attribute framing would have an impact on respondents' stated preferences, so we included two versions of the survey. Respondents would be assigned the different versions randomly, and no information about the two versions were given to the respondents.

The thesis is structured as follows: First, we will provide an overview of research on cruise ship tourism and tourism in general, as well as how question framing has been used in previous research. Then, an explanation of utility theory, externalities, what a discrete choice experiment is, and how question framing works. We will then discuss how we have conducted our experiment by showing how the different scenarios were built, a discussion about our econometric model will follow. After this our results will be presented and discussed before a conclusion is drawn.

2 Literature review

There are several studies on the topic of residents' perceptions and attitudes towards tourism (Andriotis & Vaughan, 2003; Gursoy, Chi, & Dyer, 2009; Kibicho, 2008; Ko & Stewart, 2002; Lepp, 2008; Long & Wall, 1996; Mohsin, 2005). According to Ritchie & Inkari (2006), it is important that local authorities consider residents' perceptions and attitudes towards tourism when developing tourism policies, since it is a vital part of a sustainable tourism industry. The local community should be an active contributor when designing and managing the local development of tourism, since this could positively influence residents' perceptions and attitudes towards tourism (Simpson & Bretherton, 2009). According to Johnson (2002), political will to safeguard cruise destinations is vital in order to reduce proved adverse effects of poorly managed cruise tourism. He also concludes that there is a need for greater profit sharing between cruise line shareholders and destination communities.

There are many factors that contribute to variation in residents' perception and attitudes towards tourism. For example, the level of contact with tourists (McGehee & Andereck, 2004), the degree of tourism concentration (Pizam, 1978), geographical proximity to substantial tourism activity (Amuquandoh, 2010; Sheldon, Var, & Var, 1984), community attachment (Gursoy & Rutherford, 2004), the current state of the economy (Pérez & Nadal, 2005), the level of interactions with tourists (McGehee & Andereck, 2004), environmental impacts from tourism (Smith & Krannich, 1998), and those that are economically dependent on the tourist industry generally express more positive impacts than negative impacts from tourism (Smith & Krannich, 1998). Previous research suggests that if the tourism industry is well-developed, residents' attitudes towards visitors will be positively affected since the increased economic activity improves local wealth by generating more job opportunities (Dyer, Gursoy, Sharma, & Carter, 2007; Jamal & Getz, 1999; Kibicho, 2008).

We expect that residents' perceptions and attitudes towards tourism can be causally related to their preferences for tourism. The variables that impact residents' perception and attitudes is therefore considered to be central when it comes to variation in residents' preferences. For example, we assume that an individual who is negative towards tourism will prefer less tourists.

Studies on this topic that specifically investigate residents' preferences for cruise tourism are emerging (Brida, Del Chiappa, Meleddu, & Pulina, 2012; Brida, Riaño, & Aguirre, 2011; Diedrich, 2010; Gibson & Bentley, 2007; Hritz & Cecil, 2008; Stewart, Dawson, & Draper, 2011). The contribution by Brida et al. (2012) investigates residents' preferences for investment in cruise tourism. The study concluded that most people living near the port of Messina were willing to invest a substantial amount of money in cruise tourism. But some of the respondents also voiced their concern about the environmental impact that might accompany increased cruise tourism activity. Some also feared that increased tourism might cause a deterioration of the local heritage and culture. A study with a similar theme by Stewart et al. (2011) finds that residents' attitudes towards cruise tourism could be related to the current prevalence of cruise tourism. The respondents from Cambridge Bay, where cruise tourism is emerging, was relatively more positive towards cruise tourism than respondents from Pond Inlet, which is one of the more popular cruise destinations in Arctic Canada. These results indicate that the level of exposure to cruise tourism externalities will influence residents' perceptions and attitudes for the cruise tourism industry. But in general, both communities were accepting of cruise tourism, because of the economic contribution from the industry. The major concern for the residents' were related to cultural change and interference with local hunting traditions.

Diedrich (2010) conducted a survey in Belize regarding residents' preferences for different types of tourists. The results from the survey indicate that residents perceive cruise tourists as less concerned about the environment compared to overnight visitors. This is an important factor for many residents since ecotourism is substantial in Belize. However, most businesses in Belize City is positive to expanding the cruise tourism industry. They perceive the economic benefits from increased cruise tourism to be substantial. The economic and environmental impacts seem to be the main factors for variation in preferences. This illustrates the importance of securing a sustainable cruise tourism industry, where both the economic and environmental factors are considered. It is also clear that many residents do not want an expansion in cruise tourism if it has a negative impact on overnight tourism. This implies that local authorities should aim to develop the cruise industry in such a way that it does not interfere with overnight tourism.

To further our contribution to this area of research, we have also looked at how attribute framing affects people's perception of the different attributes, and how this might influence their preference. Previous research on this area have focused on healthcare (Veldwijk et al., 2016), investment risk (Kragt & Bennett, 2012) or pollution (Camilleri & Larrick, 2014). The results from these studies has shown that how the question is framed, especially when the two different variations are perceived as being positive and negative, can greatly affect how the people perceived the choices, and therefore their preference for the different alternatives. This shows that how the questions are framed throughout the study influences how the respondents perceive the different choices they are given and will be reflected in their preferences.

3 Theory

3.1 Consumer theory

According to Lancaster (1966), consumption is assumed to be an activity in which goods, either a single good or a bundle of goods, are inputs and in which the output is a collection of characteristics. The ordering of preferences is assumed to rank collections of characteristics, implying that the ranking of goods happens indirectly through the characteristics that are possessed by the goods. In summation, the consumer theory proposed by Lancaster assumes that:

- A bundle of goods does not give utility to the consumer, the goods possess characteristics, and utility is derived from these characteristics.
- In general, a good possess multiple characteristics, and the characteristics will be shared by more than one good.
- Goods in combination may possess characteristics that are different from the characteristics possessed by the goods separately.

In our case, the individuals are asked to rank their preference between future outcomes. The goods in this case are intangible, which makes them harder to quantify, but are nevertheless still options that incur value and utility to the individual. They will choose to spend their time and money on achieving a desired outcome (Nicholson & Snyder, 2016). We assume that residents in the Stavanger area derive utility from the characteristics associated with visiting the city center of Stavanger for recreation. When we discuss the characteristics possessed by city center recreation, we therefore explicitly mean the characteristics which are likely to impact utility derived from a visit to the city center, regardless of which bundle of goods or activities are consumed while there. These characteristics might include, for example, environmental, visual, and social characteristics.

We assume that the perceptions and attitudes for cruise tourism in Stavanger are influenced by the utility that residents in the Stavanger area derive from visiting the city center. An increase in the level of cruise tourism in Stavanger will influence the visual, environmental, and social characteristics possessed by city center recreation. This could be both negative and positive at the same time, depending on the tastes of each individual. For example, the

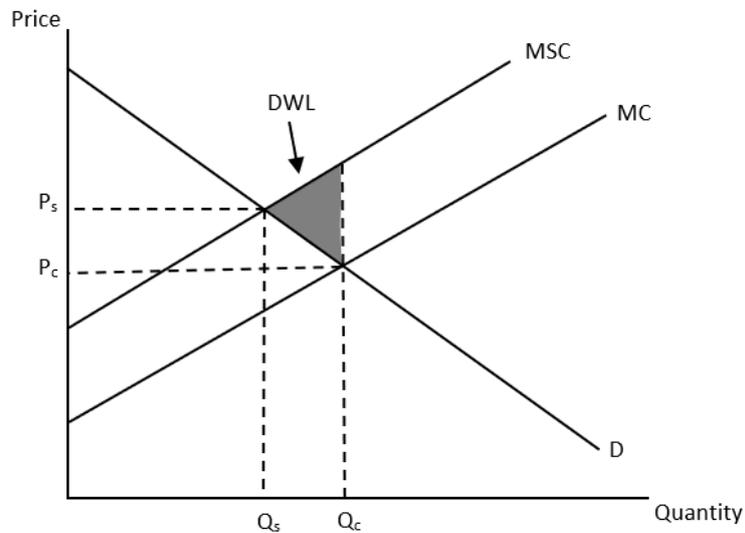
increase in cruise tourists will impact the social characteristics of city center recreation by making it a more culturally diverse place to visit. However, an increase in tourists could also lead to more waste and litter, thereby impacting the environmental characteristics of city center recreation.

3.2 Externalities

Externalities can be defined as “action by either a producer or a consumer which affects other producers or consumers but is not accounted for in the market price” (Pindyck & Rubinfeld, 2015, p. 658). When there are externalities present, firms may produce too much or too little since the external cost or benefit from production is not internalized. This would be the case of externalities in production and could lead to an inefficient market outcome. The same logic would apply for externalities in consumption. The external cost or benefit from consumption is often not considered by individuals when they make a consumption decision. Hence, they consume too little or too much relative to the socially optimal consumption level (Nicholson & Snyder, 2016).

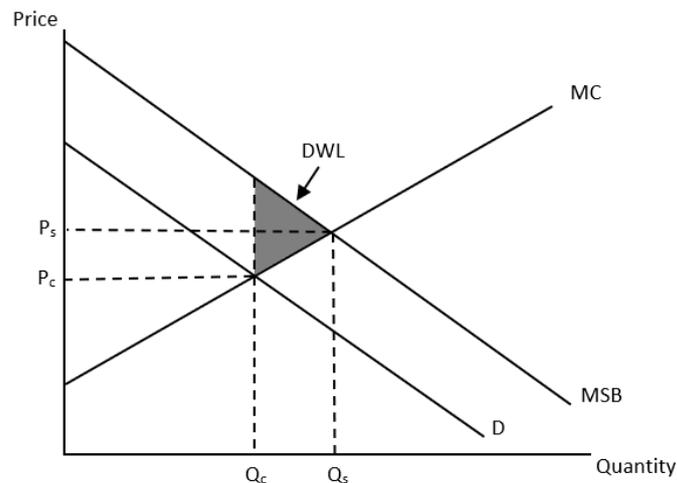
When externalities are negative, the result is excess production or consumption and unnecessary social costs. A negative externality occurs, for example, when firms fail to internalize the external costs of pollution due to their production. In this situation the firm does not consider the harm associated with negative externalities. Figure 1 illustrates a market where negative externalities in production are present. We assume that the input to production is fixed for all firms, so that the only way to reduce externalities is by lowering production. The supply curve (MC) for the industry does not include external costs to society. The private market equilibrium is represented by the point (Q_c, P_c) , where market demand (D) is equal to market supply. This equilibrium is not efficient since external costs are not accounted for. The marginal social cost curve (MSC) accounts for all costs of production, both internal and external. The efficient social market equilibrium is the point (Q_s, P_s) , where market demand is equal to the marginal social costs, and $Q_s < Q_c$ and $P_s > P_c$. In the case of the private market equilibrium there is a deadweight loss (DWL) because of excess production. The deadweight loss is illustrated by the shaded triangle in Figure 1. The intuition would be the same for a market where there are positive externalities in production, only opposite. So, instead of $MSC > MC$, we have that $MSC < MC$ if there are positive externalities in production.

Figure 1: Negative externalities in production



When externalities are positive the result is too little production or consumption and lost social benefits. Figure 2 illustrates a market where positive externalities in consumption are present. The private market equilibrium (Q_c, P_c) is not efficient, since the social benefits from consumption is not incorporated in private demand for the good. A relevant example could be demand for house upgrades. Individuals looking to upgrade their house will most likely not consider that their upgrade might influence the neighboring property values in a positive way. The marginal social benefits curve (MSB) accounts for all the benefits of consumption, both internal and external. The efficient social market equilibrium is the point (Q_s, P_s), where the marginal social benefits is equal to the marginal cost, and $Q_s > Q_c$ and $P_s > P_c$. In the case of the private market equilibrium there is a deadweight loss (DWL) because of too little consumption. The deadweight loss is illustrated by the shaded triangle in Figure 2. The intuition would be the same for a market where there are negative externalities in consumption, only opposite. So, instead of $MSB > D$, we have that $MSB < D$ if there are negative externalities in consumption.

Figure 2: Positive externalities in consumption



Incentive based solutions can be used to reduce the effects from negative externalities. Since output is too high under the market determined equilibrium, a straightforward solution is to tax the entity that is creating the externality so that the quantity consumed or produced is reduced to the social equilibrium. For the case of positive externalities, the same logic applies, but instead of taxing the externality producing entity you subsidize them. This should increase the quantity consumed or produced to the social equilibrium (Nicholson & Snyder, 2016).

The side effects from tourism activity can have both positive and negative impacts on destination communities. These effects constitute externalities, as they are benefits or costs that tourists or firms in the tourism industry impose on others. These externalities are not fully accounted for in the market, leading to individual decisions that might not be optimal for society (Schubert, 2009).

Externalities that negatively affect residents' utility are, for example, crowding and congestion, noise, litter, pollution, degradation of nature, depletion of wildlife, and increased prices for goods and services. On the other hand, the impacts from tourism can be positive, resulting in increased utility for residents' in destination communities. Externalities that positively affect residents' utility are, for example, better infrastructure, improved standard of living, employment opportunities, cultural exchange, increased offer of leisure activities, protection of nature and wildlife, and maintenance of historical buildings (Schubert, 2009).

As illustrated by the numerous examples above, tourism activity is associated with both positive and negative externalities. The overall effect of both negative and positive

externalities from tourism activity can change from positive to negative, or vice versa, depending on the level of tourism (Schubert, 2009). We assume that the examples hold for the specific case of cruise tourism.

3.3 Quality changes: equivalent and compensating surplus

In environmental economic theory, compensating surplus (CS) and equivalent surplus (ES) represents monetary measures of the utility change associated with change in either quality or quantity of environmental services. Compensating surplus and equivalent surplus can be directly related to the willingness to accept (WTA) or the willingness to pay (WTP) for changes in quality or quantity of environmental services. Whether to use WTP or WTA depends on what type of environmental change we are investigating, improvement or deterioration, and if the individual has property rights to the environmental service in question. Table 1 summarizes the relationship between the monetary measures of the utility changes associated with changes in quality or quantity of an environmental service (Perman, Ma, McGilvray, & Common, 2003).

Table 1: Monetary measures for environmental quality changes

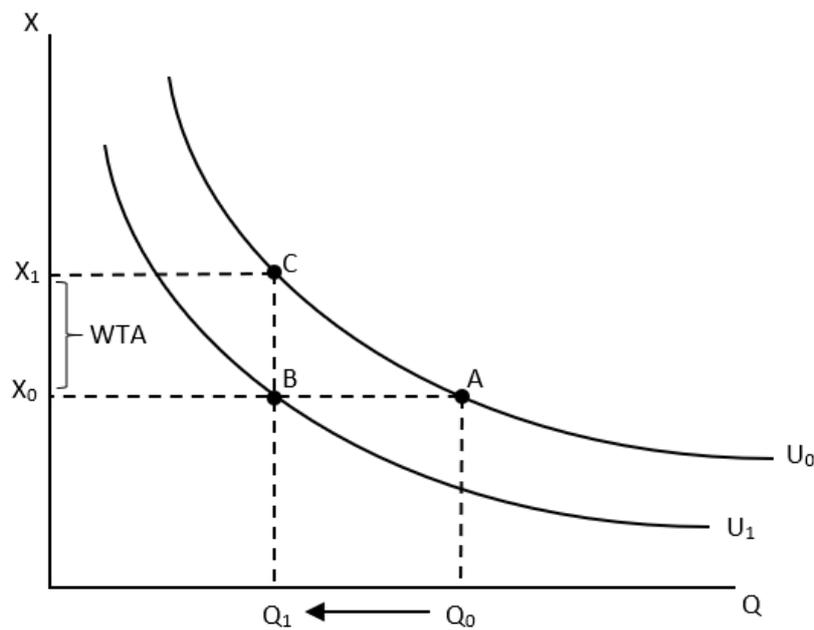
	CS	ES
Improvement	WTP for the change occurring	WTA compensation for the change not occurring
Deterioration	WTA compensation for the change occurring	WTP for the change not to occur

The table is taken from Perman et al. (2003, p. 409).

We focus our attention on a situation where there is a deterioration of the environment. We assume that the individual has a well-behaved utility function $U = U(Q,X)$, where Q is the level of environmental quality or quantity, and X represents market goods and services. Typically, Q is non-exclusive and non-divisible, so the individual cannot adjust his or her consumption level. In Figure 3, the individual is initially at point A, and the combination (Q_0, X_0) gives him utility level U_0 . Let us assume that, for example, the level of cruise tourism activity increases to a point where the overall effect of externalities is perceived to be negative by the individual. So that the level of environmental quality Q is reduced from Q_0 to Q_1 . The individual is now at

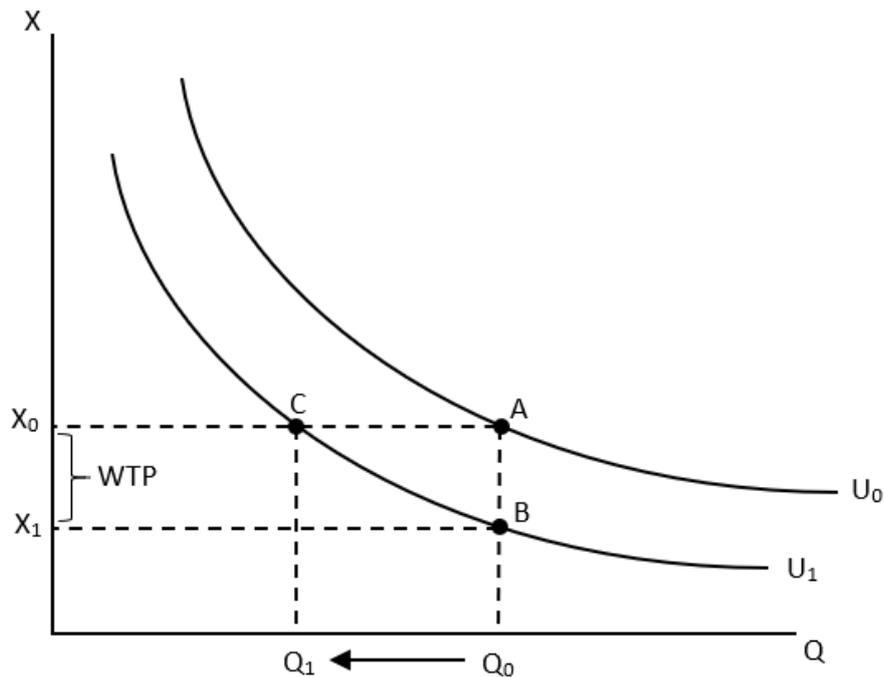
point B, which is a combination (Q_1, X_0) that yields a lower level of utility U_1 . If the individual has property rights to the environmental service in question, he could demand compensation for the decrease in utility. In Figure 3, WTA represents the willingness to accept compensation for the occurring change. The WTA also represents the compensating surplus, since the individual would need to be compensated with $X = X_1 - X_0 = \text{WTA}$ in order to get his initial utility level U_0 , he or she would then be at point C (Perman et al., 2003).

Figure 3: Compensating surplus and WTA



Similarly, Figure 4 illustrates the situation already explained above, but when the individual does not have property rights to the environmental service. The individual is initially at point A, and the combination (Q_0, X_0) gives him utility level U_0 . We assume that the environmental quality deteriorates, like in the previous example, so that the level of environmental quality Q is reduced from Q_0 to Q_1 . The individual is now at point C and receives a lower level of utility U_1 . WTP represents the willingness to pay to avoid the deterioration, it also represents the equivalent surplus since the individual would be willing to pay $X = X_0 - X_1 = \text{WTP}$ in order to stop the deterioration. If the individual can successfully pay to avoid the deterioration, he would be at point B, and still get utility level U_1 . So, the choice is either to accept the environmental deterioration, or to give up $X = X_0 - X_1 = \text{WTP}$ (Perman et al., 2003).

Figure 4: Equivalent surplus and WTP



For an environmental deterioration, whether to use WTP or WTA as the correct monetary measure depends on the property rights. If the individual does not have any property rights to the environmental service in question, the correct measure is WTP. If the individual on the other hand has property rights to the environmental service, then the correct measure to use is WTA. In theory WTP and WTA should be similar values, but in practice this is not always the case. The observed disparity between WTP and WTA could have implications for environmental policy, since these measures are often used to calculate compensatory claims or Pigouvian tax levels (Kim, Kling, & Zhao, 2015).

The potential increase of cruise tourism to Stavanger may increase the negative externalities associated with the industry, this can be viewed as an environmental deterioration. Since property rights lie solely with Stavanger municipality, the residents cannot demand compensation for the perceived deterioration, this means we cannot estimate the deterioration in terms of WTA. We therefore use the WTP measure when investigating what people are willing to pay to avoid the deterioration.

3.4 Discrete choice experiment

When revealed preference data is not available, the stated preference method can be used to estimate measures of economic value. This is typically done by asking individuals to answer survey questions. One common approach is to conduct a DCE. With discrete choice experiments, respondents are asked to indicate their preference among two or more multi-attribute alternatives. These kinds of methods represent the only known approach to estimate values for changes in many public goods, and other outcomes for which direct or indirect revealed preference (RP) data may not be available. These methods are therefore the only available means to estimate nonuse (or passive use) values or use value for something that fall outside current observed conditions or markets. In order to estimate the economic value for the different attributes, the attribute levels are varied for the different scenarios (Johnston et al., 2017).

As opposed to other methods of inferring preferences, where respondents are often asked to rank or rate alternatives, a DCE presents a reasonably straight forward task which more closely resembles a real-world decision. Each alternative is described using several characteristics known as attributes, and responses to the alternatives, or more precisely how a respondent values one alternative over the others, is used to infer value placed on each of the attributes (Mangham, Hanson, & McPake, 2009).

DCE's are therefore good at showing how individuals are willing to trade one attribute for another based on their significance to the individual's overall utility. And information on the relative importance of the attributes can be used in policy decisions, which is why we hope this study will prove useful for local government.

Since DCE creates a map of the relative value of the different attributes, we can use the results to estimate a marginal valuation, or willingness to pay (WTP) for a unit change in each attribute (Johnston et al., 2017).

SP methods are however somewhat controversial as their validity has been questioned because of some highly publicized cases, and with papers questioning if the method can provide credible information to inform decision making. The biggest issue facing DCE is that of hypothetical bias (Johnston et al., 2017). Since the respondents are asked to evaluate

hypothetical cases, their choice and the cost inferred from that choice, might not be fully understood as a cost for the respondent. In our case, if the person is expected to choose a hypothetical scenario that has a specific cost, this cost must be interpreted as an actual real cost they would have to pay, for the results to be valid. We will revisit this issue under the results section of the paper.

3.5 Framing

Choices are never made in a vacuum but are influenced by the context they are set in. When designing a label, you have a choice of which metrics to include, and if you have reasons to believe that one metric (e.g. the number of cruise ships annually), will influence consumer preferences more than another (e.g. the number of cruise tourists annually), even when these two metrics are just two different ways of presenting the same attribute (Camilleri & Larrick, 2014). And others have argued that people form a preference through task-contingent strategies that is tied to the representation of a problem (Payne, Bettman, & Johnson, 1992). Importantly, people have an easier time to decide if the information they are presented works in their favor of deciding. So, if you have a choice between two different cars, you might have an easier decision to make if you are presented the fuel economy not as liters per mile, but as total fuel cost per year. And although consumers can make this transformation themselves, they are either unwilling, or not able to do so (Camilleri & Larrick, 2014).

In our case, we wanted to see if framing would affect peoples' perception of our main attribute, the level of cruise tourism to downtown Stavanger. To facilitate this, we elected to represent this metric in two different, but equal ways, the number of cruise ships and the number cruise tourists visiting the city each year. These two metrics are simple translations of each other, but they display the attribute in two very different ways. For someone who is concerned with the level of cruise tourism to the area, they might be more affected by how many tourists visit the city, compared to how many ships visit.

We can theorize that people would react to these two ways of displaying our main variable since cruise ships mostly connote visual and pollution associations, while the number of tourists could mostly be associated with crowding of downtown. There might be reason to believe that framing our main attribute in two different ways could affect peoples' preference for a reduction in the cruise tourism to the area.

3.6 Hypotheses

Based on the results from previous research and relevant theory we form some hypothesis for how we expect residents' preferences for cruise tourism to vary.

1. People have a positive WTP to restrict further expansion of cruise ship tourism in the downtown Stavanger area.
2. Attribute framing will influence WTP for restricting cruise ship tourism.
3. People residing close to, and who are exposed to, cruise ship tourism have a different preference for restricting cruise ship tourism than people who are less exposed.
4. People with different demographic characteristics have a different preference for restricting future cruise ship tourism.

4 Method

4.1 Design of the Discrete Choice Experiment

When designing the discrete choice experiment, we included attributes based on prior research and assumed relevance. The levels and attributes were finalized after several rounds of testing and interviews. For all the different attributes we estimate a “status quo” level for 2025 and then vary this level to provide choice alternatives, this is to better illustrate that the respondents could choose their own future. A key decision had to be made at this point, were we had to value the gain in information from adding more attributes, against the cost of making the experiment more of a cognitive burden. The attributes and levels are summarized in Table 2.

Table 2: Levels and attributes

Version	Number of ships	Number of tourists
Visitors	350 (Status quo)	770 000 (Status quo)
	300(-15%)	655 000 (-15%)
	245 (-30%)	540 000 (-30%)
Employment in tourist industry	6800 jobs (Status quo)	6800 jobs (Status quo)
	5780 (-15%)	5780 (-15%)
	4760 (-30%)	4760 (-30%)
Pollution	30kg CO ₂ (Status quo)	30kg CO ₂ (Status quo)
	Low reduction (10%)	Low reduction (10%)
	High reduction (20%)	High reduction (20%)
Change in taxes payable	0 NOK (Status quo)	0 NOK (Status quo)
	+1200 NOK	+1200 NOK
	+1800 NOK	+1800 NOK
	+2400 NOK	+2400 NOK
	+3000 NOK	+3000 NOK

The number of arriving cruise ships at Stavanger harbor in 2020 is estimated to be around 250 arrivals, this is around a 7% increase from 2019 (Stavangerregionen Havn IKS, 2020). We used the 7% growth rate in order to estimate the status quo level for 2025, which indicates 350

arrivals. This is a relevant attribute since variation in number of arriving ships can be linked to the residents' level of exposure to tourists (McGehee & Andereck, 2004). Since the ships are large, we also expect that people will have preferences because of the visual impact. To control for preferences towards the visual impact, we include an attribute for the number of cruise tourists arriving. Survey respondents will randomly be assigned choice sets with "arriving cruise ships" or "arriving cruise tourists" as the first attribute. It is then possible to compare if residents have different preferences for cruise tourists and cruise ships. The average number of tourists per ship was 2000 in 2019, but in the next couple of years there will be a substantial increase in large ships with higher passenger capacity (Stavangerregionen Havn IKS, 2020). When estimating the status quo level for "number of tourists arriving" we have increased the average number of tourists per ship from 2000 to 2200, resulting in an estimate of 770 000 cruise tourists arriving in 2025. This split between cruise ships and tourists was made to test if there is any difference in preference between the samples because of attribute framing.

According to Brida et al. (2012), the economic contribution from cruise tourism will affect residents' preferences. There have been multiple studies done on cruise tourists spending habits and the economic impact on cruise destinations (Brida & Zapata Aguirre, 2010; Dwyer & Forsyth, 1998, 1996; Dybedal, 2019; Dybedal & Haukeland, 2017; Dybedal, Rideng, Haukeland, & Grue, 2006; Frafjord, 2017; Larsen et al., 2013; Seeberg, Haugland, Løge, Aalen, & Jakobsen, 2018; Wattoe, 2014). There is substantial variation in the estimated economic contribution from cruise tourism. The study by Dybedal (2019) summarizes ten different studies on the economic impact from cruise ship tourism on cruise ship destinations in Norway and estimates that 600-800 NOK is a reasonable estimate per cruise tourist for each visit to a port. From testing and personal interviews, we consider that the best way of including economic contribution in our survey is to consider employment in the tourist industry. The monetary value contribution from the industry does not necessarily reflect an increase in wealth for residents. We therefore think that the number of jobs supported by the industry might be a more relatable figure for the respondents. According to Jakobsen & Dombu (2018) the number of people employed in the tourist industry in Stavanger was 5700 in 2018. The number of employees in the tourist industry in Norway have increased by around 3% each

year (Jakobsen & Dombu, 2018). By using the historic growth in the industry, the attribute level for the status quo scenario is estimated to be around 6800 employees in 2025.

The results from Smith & Krannich (1998) indicate that changes in environmental impacts from tourism will cause variation in residents' preferences for tourism. This is consistent with the research by Brida et al. (2011), suggesting that the relationship should hold for the specific case of cruise tourism. The effect on local air quality by the presence of cruise ships is not significant, but the contribution to global emissions can be documented (Østebø, 2019). We based our estimate of average CO₂ emission of 30kg per cruise tourist per day on a report from THEMA Consulting Group (2020). Stavanger harbor is charging a differentiated docking fee, based on the level of emissions from the ships. This could incentivize the use of cleaner fuel and hence increase the proportion of LNG fueled ships that arrive at the harbor (Stavangerregionen Havn IKS, 2020). For the status quo scenario in 2025 we therefore arrive at approximately 30kg CO₂ per cruise tourist per day. To make this figure more relatable we include information about the average daily emissions from Norwegian inhabitants in the survey (Øvrebø, 2019).

Stavanger municipality were estimated to receive around 166 million NOK in tax revenues from people employed in the tourist industry in 2018 (Jakobsen & Dombu, 2018). We include the attribute "change in taxes payable" to measure residents' preferences in terms of their willingness to pay for alternative scenarios. The use of taxes seems reasonable since the alternative scenarios might influence municipality revenues or costs.

After the final set of levels and attributes was determined, a model was created and put into the software NGENE to create the efficient experimental design, while ensuring the identification of the main effects. Some restrictions were implemented to facilitate realistic scenarios, e.g., a reduction in employment while visits were kept constant and taxes increased, an unrealistic scenario, which would be an objectively worse situation than status quo, was therefore removed through such a restriction.

Figure 5: Example of choice card presented to respondents

	Status quo	Alternative 1:	Alternative 2:
Number of tourists Per year 	770 000	540 000 (-30%)	655 000 (-15%)
Number of jobs In the tourist industry 	6800	6800 (0%)	4760 (-30%)
Pollution Per person, per day 	30kg CO ₂ 2 times as much as the average citizen	-10% (27kg CO ₂)	0% (30kg CO ₂)
Taxes payable Change in yearly tax 	No change	Pay 2400kr MORE tax every year	Pay 1800kr MORE tax every year
	Status Quo <input type="radio"/>	Alternative 1 <input type="radio"/>	Alternative 2 <input type="radio"/>

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In the end, 12 choice sets were created, you can see an example of a choice card in Figure 5 and its counterpart for ships in appendix 1. We made a choice to restrict the number of choice sets sent to each respondent to prevent question exhaustion as the survey was already quite complex. The two versions of the survey, ships and tourists are identical, with only the framing of the first attribute being different.

4.2 The Survey Implementation

Initially the plan was to collect data through on-site survey distribution in the city center of Stavanger. We also considered to use link distribution on social media if the on-site distribution had a low response rate. However, due to unforeseen extenuating circumstances,

the on-site survey distribution was hindered. The survey was set active March 22nd, thereby coinciding with the general stay at home order given in Norway. Meaning the original plan of on-site distribution in downtown Stavanger was no longer possible, limiting us to only utilize social media and other personal contacts to try and distribute the survey. The survey remained open for three weeks until April 14th.

As a general note towards the representativeness of the sample. Since the original plan for survey distribution was not possible, the Facebook link distribution method have most likely introduced some bias. The sampling is not random, as the survey would only reach people who are friends with the writers on Facebook, and although the sample was shared by others, this does not mean the sample was distributed correctly. The link distribution itself does also favor friends and family since they are more inclined to take the survey and would therefore take the survey at a higher rate than other people. We have no way to know who took the survey as the respondents were anonymous.

The information given to possible participants was restricted in order to avoid overrepresentation of individuals with strong opinions on the topic of cruise tourism. Possible participants where only informed that the survey would help our research on the topic of tourism in Stavanger, however, as the main distribution method ended up being online, we were not fully in control over the information that was shared by other respondents.

The survey consisted of three parts; 1. introduction, 2. discrete choice experiment and, 3. socio-economic characteristics and attitudinal questions. You can see a complete example of a survey in appendix 2.

The introduction included some general information about the questionnaire and its purpose. Respondents was also given information on the topic of cruise tourism in Stavanger to provide context.

In the next part of the questionnaire, we explained the different choice experiment attributes and the structure of each choice set. The respondents would have to choose between the “status quo” scenario, which assumes no change in regulation and hence no change in taxable income, and two other alternative scenarios. In the alternative scenarios the attributes are varying, reflecting changes in technology, regulation or socio-economic characteristics. Every

respondent was given 6 different choice sets where they had to choose the scenario they preferred. We stressed the importance of considering what an increase in taxes payable would mean for the respondents' financial situation. We had two versions of the survey, either "ships" or "tourist". For each respondent, either "number of cruise ship arrivals" or "number of visiting tourists" was the first attribute in the choice sets. We used this division to see if there was any difference in the way people assessed cruise ship tourism based on how we framed the attribute. This process was randomized so that each respondent had a 50% chance of getting either alternative as the first attribute. We had 24 choice sets in total, divided into 12 choice sets for the "ships" version and 12 choice sets for the "tourist" version. Each respondent received 6 choice sets, so we had in total 4 different "blocks" of choice sets. The blocks were constant, meaning that for each the choice sets would be in the same order for all respondents. This could lead to some situational bias, since the order could influence how they answer the next question.

The last part of the questionnaire included multiple questions on socio-economic characteristics. Respondents was asked about their age, level of income, gender, education, area of residence and others. This information was gathered to see if the socio-economic characteristics influence preferences for cruise tourism, and to investigate if our sample is representative. Previous research by Dugstad et al. (2019) and Stewart et al. (2011) have shown that exposure will influence people's perceptions and attitudes. So, we theorized that how close someone lives downtown, or how often they are downtown will influence how they perceive cruise tourism.

5 Econometric model

The theoretical foundation for discrete choice experiments is the random utility model which relies on utility maximization and rationality assumptions (McFadden, 1974). In this model, it is assumed that the utility function of each respondent is the sum of a deterministic term and a random term. The deterministic term can be described as a function of factors that influence respondents' utility and the random term is unobservable and stochastic for researchers (K. E. Train, 2009).

We use the general mixed logit model specification from Revelt and Train (1998). Survey respondent n choose between J alternatives on T choice occasions. The utility that respondent n gets from choosing alternative j on choice occasion t is given by: $U_{njt} = \beta_n' x_{njt} + \varepsilon_{njt}$, where β_n is a vector of individual specific coefficients and x_{njt} is a vector of observed variables. β_n is unobserved for each n and varies in the population with density $f(\beta_n | \theta^*)$, where θ^* are the true parameters of this distribution. We assume that β is normally distributed. The random term ε_{njt} is assumed to be an independently and identically distributed extreme value.

Conditional on knowing β_n , the probability that respondent n chooses scenario i on choice occasion t is given by:

$$L_{nit}(\beta_n) = \frac{\exp(\beta_n' x_{nit})}{\sum_{j=1}^J \exp(\beta_n' x_{njt})}$$

For maximum likelihood estimation we need the probability of each sampled person's sequence of observed choices. Let $i(n,t)$ denote the alternative that person n chose in period t . The probability of person n 's observed sequence of choices conditional on knowing β_n is given by:

$$S_n(\beta_n) = \prod_{t=1}^T L_{ni(n,t)t}(\beta_n)$$

The unconditional probability of the observed sequence of choices is the conditional probability integrated over the distribution of β :

$$P_n(\theta^*) = \int S_n(\beta_n) \cdot f(\beta_n | \theta^*) d\beta_n$$

The goal of this model is to estimate θ^* , which is the population parameters that describe the distribution of the individual parameters.

The log likelihood function is given by: $LL(\theta) = \sum_{n=1}^N \ln P_n(\theta)$. It is not possible to solve this expression analytically, and it is therefore approximated using simulation methods.

When estimating our model, we include an alternative specific constant (asc) to account for the status quo option. The asc is included as a dummy that takes value 1 each time a respondent chooses status quo in the survey (Meyerhoff & Liebe, 2006). The asc is clearly defined and do not vary across different choice situations, it is therefore included as a fixed parameter in the model (i.e. we assume that β is equal for all respondents).

We chose to also hold the cost parameter fixed since this allows convenient derivation of willingness to pay. This is a trade of between the accuracy of the model and convenience of estimation, since it might be unreasonable to assume that individuals have the same preference for cost (Hole & Kolstad, 2012; Revelt & Train, 1998).

The rest of the parameters are specified as random and correlated since we assume heterogeneous preferences and include repeated choices by each respondent.

After we estimate the mixed logit model, we can use the coefficients to calculate an estimate for the willingness to pay for our attributes. We used the following WTP formula:

$$E(WTP^k) = -\frac{E(\beta^k)}{\beta^{cost}}$$

Where β^k is the estimated coefficient for the random parameter k and β^{cost} is the estimated coefficient for the cost parameter.

6 Results

In total, 272 people started a response to the survey, but only 108 completed the survey. This means a total of 60% dropped out. The survey itself was available in both English and Norwegian, with the respondents selecting the languages at a rate of 14% and 86% respectively. When we look at the respondents who completed the survey, the trimmed average time to completion was just over 6 minutes. We removed 10 respondents from this average as they had spent more than 1 hour to complete the survey, with the longest completion time being over 65 hours, it was assumed that they had not spent the time actively trying to complete the survey. The dropout rate is therefore attributed to the general complexity of the survey, and not the time it took to complete it. The respondents needed to read around 3 pages of information about the survey in general, and the set-up information needed to understand the following choices. Given that most of the drop outs, had completed some of the choice sets, we can assume that they either did not read the introductory information well enough, and therefore did not understand the questions or how to select their choice, or that they simply had no interest for completing the survey. There might also have been some people who started the survey, and left it mid ways, only to complete it later but started a new session.

For future research, the complexity of these kinds of questions, and the task the respondents are supposed to complete, might need some restructuring. With clearer information about how far into the survey the respondent has come, to avoid people dropping out just as they near the end. No respondent quit after reaching the final set of background questions, meaning they ended their participation either in the introductory phase, or during the choice sets. The respondents were instructed to contact the writers of this paper if they had any question related to either the survey itself or its purpose, no such contact was made from any respondent, the writers assume this means that both the purpose and the questions was well understood by the people taking the survey.

As the respondents were randomly assigned to one of four blocks of questions, the final distribution of the 108 who completed the survey was as follows; 29 got block 1, 22 got block 2, 30 got block 3, and 27 got block 4.

Table 3: Background demographics

		Whole sample	Ships	Tourists
Observations	People	108	51	57
	Percentage		47%	53%
Average age (years)		41	42	40
Gender	Female	50%	63%	39%
	Male	47%	35%	60%
	Prefer not to say	3%	1%	2%
Ever been or plan to go on a cruise vacation	Yes	31%	37%	26%
	No	66%	63%	68%
Opinion about continued cruise ship tourism	Positive or very positive	55%	55%	54%
Education	High education, bachelor or more	74%	76%	72%
Do you think you have to pay more tax to reduce cruise ship tourism?	Yes	65%	65%	65%
	No	14%	15%	12%
	Unsure	21%	20%	23%
Chosen scenario	Status quo	33%	35%	31%
	Alternative 1	32%	32%	32%
	Alternative 2	35%	33%	37%
Has the current pandemic (COVID -19) affected your choices?	No change	78%	78%	77%
	More positive	1%	0%	1%
	More negative	15%	18%	12%
	Unsure	6%	4%	10%
Income	Mean annual gross personal income	600,001 - 8000,000 NOK		

Table 3 provides the descriptive summary of the respondents, out of the full sample and the two framing treatment groups. Looking closer at the respondents who completed the survey we can see that the overall sample is somewhat representative, with the average age being just shy of 41 years of age, with 51 identifying as male, 55 as female and, 2 who selected not

to answer. While the full sample has a good gender balance, this is not true for the two sub-samples, where the ships sample has more female respondents, and the tourist sample has more male respondents. This is however the only major demographical difference we found in the sample.

A substantial 31% of the respondents had been on a cruise vacation previously, and 55% saying they are either positive or very positive to continued cruise ship tourism. There is also a distinctly large amount of people with higher education, as 74% of the respondents had a bachelor's degree or higher.

The respondents were also asked if they thought they might have to pay more tax to reduce pollution to the area, or in general put restrictions on the cruise ship tourism to the city. Just shy of 65% responded with yes, and 21% who did not know. We included these questions to account for hypothetical bias, which is often present in discrete choice experiments and other stated preference experiments. Based on the responses it seems that very few of the survey participants thought that they could reduce the level of cruise ship tourism without it influencing their finances. We therefore assume that most of the respondents took the increase in taxes payable represented in the choice sets as being a realistic cost of lowering cruise tourism activity.

Respondents chose between the three alternatives with relative consistency, with each of the alternatives being chosen on average around 1/3 of the time. This was consistent over the two samples. But the people in the sample have clear preferences in their choice. When a respondent has chosen status quo in two of the choice sets, it is likely that they would also choose status quo on the remaining 4 choice sets. Vice versa, a respondent that chose either alternative 1 or 2, in two of the choice sets, would also choose such from the remaining 4. This seemingly indicates that people have “preferences” to either choose to intervene to make changes to the future or not. So even though the average sample had each of the alternatives chosen at around equal probability, this is not true for the individual respondents in the sample. This could indicate that people either have different preferences for making a choice/intervention, or that they had a clear positive or negative view of the industry. The status quo option was framed as a “no intervention” option, meaning someone who did not want to restrict future traffic would have chosen this option.

People were also asked if the current situation (COVID-19) had influenced their decisions in the choice sets. 78% said that their attitude towards the industry had not changed, but 15% had become more negative, with an additional 6% being unsure. We can therefore tentatively say that the current situation might have changed people's perception of the industry.

6.1 Main estimation results

We used a mixed logit model in Stata to perform our econometric analysis. The model was written by Hole (2007), and is based on Revelt & Train (1998). The mixed logit model is very flexible and can approximate any random utility model. It allows for random taste variation, unrestricted substitution patterns, and correlation in unobserved factors over time (K. E. Train, 2009).

We experimented with several different levels of Halton draws, from 10 all the way to 10,000, we found a plateau around 1000 draws where mean root square errors were minimized, and the estimated coefficients stayed the same. We have therefore used 1000 Halton draws for all the estimations. This is in accordance with other studies and is assumed to be sufficient for this paper (K. Train, 2000; Zeng, 2016).

Table 4 shows the estimated mixed logit models with correlated random parameters for the three different samples, full sample (*Model 1*), ships (*Model 2*), and tourists (*Model 3*). The cost attribute and the alternative specific constant (asc) are fixed in each model.

From Table 4 we see that for *model 1*, the asc is negative and significant, meaning that the respondents prefer change compared to the status quo option. This indicates that despite the complexity of our survey, we do not observe a status quo effect (Meyerhoff & Liebe, 2006). The cost attribute is highly significant which means that the respondents have a negative preference for an increase in taxes payable. Both the low reduction in visitors and the high reduction in visitors are positive, but not statistically significant. The only statistically significant attributes are the high reduction in employment, which is negative, and the high reduction in pollution which is positive. This means that on average, the respondents have negative preferences for a high reduction in employment, and positive preferences for a high reduction in pollution. All the estimated coefficients have statistically significant standard deviations, indicating that although on average a preference for a reduction in cruise ship

tourism is not present, there are differences between the individuals in the sample. This means that the individual respondents have clear preferences, either to reduce or increase traffic to the area.

Table 4: Estimation results

Attributes and level	Full sample (Model 1)		Ships (Model 2)		Tourists (Model 3)	
	Coef.	SD	Coef.	SD	Coef.	SD
	asc	-2.9140*** (0.7788)		-2.6134** (1.1935)		-5.1284** (2.0766)
cost	-0.0012*** (0.0002)		-0.0016*** (-0.0004)		-0.0016** (0.0006)	
visit_lr	0.4384 (0.5249)	3.0362*** (0.5870)	0.1398 (0.8530)	3.6414*** (-1.1304)	0.4046 (0.8429)	3.9865** (1.6554)
visit_hr	0.5922 (0.5650)	4.0724*** (0.8604)	-0.0768 (0.9947)	4.3938*** (1.2024)	1.5127 (1.0615)	5.5706** (2.5879)
employ_lr	-0.4651 (0.4945)	2.9440*** (0.6402)	-0.2044 (0.7729)	2.3558** (1.0276)	-1.2578 (1.0201)	4.5731** (1.8335)
employ_hr	-2.381*** (0.6015)	3.7546*** (0.6741)	-1.2997* (0.7708)	2.3742*** (0.8303)	-4.3277*** (1.5951)	6.4122*** (2.3783)
poll_lr	0.6975 (0.5226)	3.1137*** (0.6220)	0.4844 (0.8248)	3.0293*** (0.8476)	1.0555 (1.1175)	4.6908*** (1.7959)
poll_hr	1.4508** (0.6844)	6.4941*** (1.2293)	1.4676 (1.3732)	7.5886*** (2.1628)	2.7940* (1.4886)	7.8894** (3.0534)
Log likelihood	-463.81		-206.15		-242.52	
Respondents	108		51		57	
Observations	1944		918		1026	
Pseudo R2	0.3048		0.3545		0.2957	

Note: ***p<0.01, **p<0.05, *p<0.1

In *model 2* and *model 3*, both the asc and cost coefficients are statistically significant. However, the size of the coefficient asc, is different in the two samples, indicating that the respondents in the tourist-sample have stronger preference for avoiding status quo, relative to the respondents in the ships-sample. In both models, almost all the estimated coefficients have the same sign. The only exception is that the estimated coefficient for a high reduction in visits is negative in the ships-model. This means that the respondents qualitatively have almost the same preferences. But the strength of these preferences is different, which can be seen from the different sizes for the estimated coefficients. The preferences for a high reduction in employment in the ships and tourist sample is statistically significant and negative in both

models. But the size of the coefficient shows that the respondents in the tourists-sample have stronger negative reaction to a high reduction in employment levels. The standard deviation is also larger for the tourists-model relative to the ships-model, meaning that there is more variation in preferences between the respondents in the tourists-sample. The preferences for a high reduction in pollution is positive for both models, but only statistically significant in the tourists-model. Even though most of the coefficients are not statistically significant, all the standard deviations are. The magnitude of the standard deviations show that the preferences are heterogeneous. The standard deviations for all the “high reduction” attributes are relatively larger than the standard deviations for all the “low reduction” attributes. This holds for both models and means that there is larger variation in preferences for the “high reduction” attributes. Since all the coefficients are larger for the tourist-model relative to the ships-model, this could mean that the strength of preferences is different for the respondents in the tourists-sample compared to the respondents in the ships-sample. We can see here that our framing of the main attribute did affect the way people answered the survey. We still did not observe a preference for a reduction in cruise ship tourism to the area, but people who were served the tourist framed survey were more negative towards a high reduction in jobs, and more positive towards a reduction in pollution. This could indicate that framing affected their stated preference.

6.1.1 Willingness to Pay

To test hypothesis 1 and 2 we needed to evaluate acceptance for the different levels of the attributes for each model in monetary terms. The estimated mean willingness to pay for each of the three models are represented in Table 5. The WTP estimates show what the respondents are willing to pay each year for a low- or high reduction in the attributes. For the full sample we see that the WTP is positive for restricting visitors and pollution, and negative for reductions in employment. This makes intuitive sense and is what one would expect from the estimated coefficients in the mixed logit models. The respondents are willing to pay more for a higher reduction relative to a lower reduction in these attributes, the same holds true for the employment attribute, but the WTP is more negative for a high reduction relative to a low reduction. The WTP estimates for a high reduction in pollution and a high reduction in employment are the only statistically significant estimates. Respondents have on average -

1948 NOK WTP for a high reduction in employment, and 1187 NOK WTP for a high reduction in pollution. On average, the respondents are willing to pay 359 NOK each year in order to reduce the number of visitors by 15%, and 484 NOK each year to reduce the number of visitors by 30%. However, neither of these mean WTP estimates are statistically significant according to the confidence interval.

Table 5: Willingness to pay

Model	Attributes and levels	WTP	CI (95%)
Full sample	visit_lr	359	-480 1197
	visit_hr	484	-441 1410
	employ_lr	-380	-1217 456
	employ_hr	-1948	-3102 -793
	poll_lr	570	-292 1433
	poll_hr	1187	65 2308
Ships	visit_lr	88	-966 1142
	visit_hr	-48	-1271 1175
	employ_lr	-129	-1097 840
	employ_hr	-817	-1862 228
	poll_lr	305	-742 1351
	poll_hr	923	-785 2631
Tourists	visit_lr	258	-788 1304
	visit_hr	964	-358 2285
	employ_lr	-801	-2129 526
	employ_hr	-2757	-4578 -936
	poll_lr	672	-612 1957
	poll_hr	1780	293 3267

CI estimates are calculated using the Krinsky and Robb (1986) method

For the sub-samples, the estimated mean WTP all have the same sign, except the high reduction in visitors attribute which is negative in the ships-model. None of the estimates are statistically significant for the ships-model, but in the tourists-model the WTP for a high reduction in employment and pollution is statistically significant. The estimated mean WTP is relatively larger for all attributes in the tourists-model, compared to the ships-model. This could indicate that the attribute framing we used had an impact on respondents' preferences and WTP for the different attributes. Specifically, it seems that respondents have stronger

preferences and a higher WTP if the attribute for visitors is framed as the number of cruise tourists arriving compared to the number of cruise ships arriving.

6.2 Exploring Preference Heterogeneity

Past literature has indicated that exposure to something affects your perception and preferences related to that thing (Dugstad et al., 2019; Stewart et al., 2011). Further we theorize that certain demographic factors might affect your willingness to pay for something, for example a budget constraint might affect your willingness to pay for something you deem non-essential (Nicholson & Snyder, 2016; Perman et al., 2003). To look at these interaction effects, dummy variables were created based on information given in the demographics section of the survey. We selected 4 demographic variables, and two variables distance and weekly, which describe how far the respondent lives from downtown and how often they are downtown respectively.

The four demographic variables are as follows; the age variable denotes anyone who is 40 or above, education denotes anyone who has achieved a bachelor or more, income denotes someone who earns the average of 600,001-800,000NOK or less, and male whether the respondent is a male. The distance dummy variable indicates if the respondent lives in one of the 9 post codes that was closest to downtown Stavanger. The postcodes were selected by the authors of this paper and are as follows; 4005, 4006, 4007, 4008, 4010, 4012, 4013, 4014 and 4077. These were chosen because the authors felt they represented a reasonable geographical area where people could be defined as living in downtown Stavanger. The final dummy variable, weekly, for whether a respondent spent at least 1 day per week in downtown Stavanger.

To explore how demographic effects and exposure affects people's preferences, we estimated two additional mixed logit models with interaction terms. In *model 4*, named "Exposure" there are two interaction terms. The first interaction is between the categorical variables for the visit attribute and a dummy variable indicating if a person lives in one of the 9 postcodes mentioned earlier. The second interaction term is between the categorical variables for the visits attribute and a dummy variable for whether the person spent at least one day downtown each week.

In *model 5*, named “Demographics”, we have interacted the categorical variables for the visit attribute with demographic information like age, education level, income and gender, to capture any differences within the sample.

The models are displayed in Table 6. In the Exposure model, the interaction effects are not statistically significant, and therefore shows that based on this sample we cannot find any difference between someone who is exposed to the cruise ships regularly, and someone who is not. This tested Hypothesis 3.

Hypothesis 4 tested whether there is a difference between people of different demographic backgrounds. Here only the income and gender variables showed statistically significant results. Specifically, when someone had average or lower income, they were less inclined to highly restrict the number of visits (significant at the 1% level), and if someone was male, they were also negative to a high restriction of visits (significant at the 10% level). This indicates that there might be some differences between the genders, and income levels, at least with regards to a high restriction placed on visits. What is interesting in this model is that the variable for high reduction in visits became statistically significant at the 5% level due to us controlling for males and average and lower incomes. This seemingly indicates that females and high earners are more negative towards cruise ship tourism.

The main estimation results of the attributes remained statistically significant throughout testing with interaction terms, indicating that these results are robust.

Table 6: Interaction effects

Attributes and level	Exposure (Model 4)		Demographics (Model 5)	
	Coef.	SD	Coef.	SD
tax	-0,00118*** (0.0002)		-0.0012*** (0.0002)	
asc	-2.8768*** (0.7884)		-2.4950*** (0.7780)	
visit_lr	0.3227 (0.5952)	3.0020*** (0.5893)	1.6260 (1.5974)	3.0212*** (0.6272)
visit_hr	0.5857 (0.7586)	3.6815*** (0.7888)	4.8314** (2.1715)	3.7476*** (0.7974)
employ_lr	-0.4464 (0.5403)	2.8149*** (0.6683)	-0.2336 (0.4936)	2.5818*** (0.5962)

employ_hr	-2.4335*** (0.6504)	3.5551*** (0.6617)	-2.3593*** (0.7003)	3.5956*** (0.7107)
poll_lr	0.6259 (0.5283)	2.7895*** (0.5799)	0.8968 (0.5690)	2.8105*** (0.6303)
poll_hr	1.6109* (0.8227)	5.6593*** (1.2353)	1.3969** (0.6438)	5.5807*** (1.0880)
visit_lr_weekly	-0.2751 (0.6302)			
visit_hr_weekly	0.2703 (0.8545)			
visit_lr_distance	0.0946 (0.7992)			
visit_hr_distance	-1.7696 (1.2095)			
visit_lr_age			0.2911 (0.7880)	
visit_hr_age			-1.2569 (1.0202)	
visit_lr_education			-0.2844 (0.9888)	
visit_hr_education			-0.8551 (1.3881)	
visit_lr_income			-1.0559 (0.8801)	
visit_hr_income			-3.3774*** (1.1894)	
visit_lr_male			-0.4813 (0.7552)	
visit_hr_male			-1.9201* (1.0292)	
Log likelihood	463.50		459.16	
Number of respondents	108		108	
Number of observations	1944		1944	
Pseudo R2	0.3021		0.2887	

7 Discussion

The estimated coefficients for the number of visitors were not statistically significant for the full sample or the sub-samples. However, the standard deviations were statistically significant, indicating that people had clear but divided opinions. But based on our sample, the average preference for the number of visiting cruise ships or tourists is neutral. The WTP estimates are also not statistically significant, meaning that there is no observed WTP to restrict the level of cruise tourism in Stavanger. We therefore fail to support Hypothesis 1.

The results from the two sub-samples indicate that if the attribute for “visitors” is framed as the “number of cruise tourists arriving”, respondents have stronger preferences and a higher WTP compared to if the attribute for visitors is framed as the “number of cruise ships arriving”. The “high reduction in employment” coefficient was statistically significant at the 1% level for the tourists-sample, and at the 10% level for the ships sample. The WTP estimate for the “high reduction in employment” is statistically significant for the tourists-sample at the 5% level, but not for the ships-sample. Since most of the estimates are not statistically significant, we have some support for Hypothesis 2, but we fail to prove it.

We failed to prove that proximity to the cruise ships is important for people’s acceptance, as the differences between the people exposed to cruise ships and those who were not, was insignificant. We therefore do not have support for Hypothesis 3. This is not in line with other research on cruise ship tourism like the study done by Stewart et al. (2011), and research on habituation done about other common goods like nature recreation areas in Norway (Dugstad et al., 2019).

We did find that average and lower income respondents are less inclined to pay for a reduction in cruise ships. This was expected since lower income people are expected to have tighter restrictions on their budgets, and a reduction in cruise ships might not have been a main priority. We also found a difference between the genders, where men were less inclined to pay for a reduction in cruise ships, the authors have no explanation for this difference. We did not find any other demographic factors that influenced people's preference for a reduction in cruise tourism. There is therefore partial support for Hypothesis 4.

7.1 Limitations

The major limitation for this paper was the restricted survey distribution. With only 108 complete responses, and the respondents not sampled randomly, the sample cannot be said to be representative for people's preferences related to future cruise ship tourism in the city of Stavanger. Since the survey distribution was hindered by the lock down orders given by the Norwegian government, this limitation should be easy to circumvent for someone wishing to redo this experiment.

Although we controlled for the recent virus outbreak, especially important given that most of the early breakouts could be traced to cruise ships and general tourism, we have no way to be certain that the respondents answered truthfully. Their perception and preferences might therefore have been affected. Future studies should make more effort to try and capture this effect.

The levels and attributes were chosen after several iterations, but some inaccuracies might still have occurred. For future research we would recommend increasing the differences between the alternative scenarios, given that we only saw statistically significant results for the high restriction options. This could be a reflection that the low restriction options were not restrictive enough for most people. Another important note is that the cruise industry might not recover quickly enough, so the projections for future visits might need to be reconsidered.

A limitation which is difficult to improve upon but is still important to consider is the general difficulty of such a survey. Since the choice sets are difficult to understand, they require extensive descriptions beforehand, both to describe the scenarios and how they can occur, but also how the respondents must make their choices. For future experiments, we would recommend making this process easier to understand or do by giving alternatives like a video for the introduction, or to better facilitate questions from the respondents during the survey.

8 Conclusion

Cruise ship visits to downtown Stavanger has grown at a steady rate during the last 10 years but is still lagging other major cruise tourism areas like Bergen and Geirangerfjord. Before COVID-19 made the future of cruise ship tourism to the city uncertain, the city had been working to expand cruise tourism to the area and wanted to increase the number of visits in the future.

Our aim with this study was to provide authorities with the information required to make informed decisions with regards to future cruise ship tourism to the area. We also wanted to improve research on local preferences for the tourism industry by utilizing a method (DCE) not usually applied in such research. To further contribute to research done with DCEs we wanted to employ framing to see if that would influence the respondents stated preference.

By conducting a DCE with framing, we have determined that the residents of Stavanger on average do not have a preference to reduce or restrict future cruise ship tourism. The individuals in the sample did however have clear preferences, with some being for a reduction in cruise ship tourism, but on average no such preference exists. With regards to attribute framing, we did find that how the question of tourism was framed, the number of ships vs the number of tourists, could affect people's WTP. However, these results are inconclusive as the WTP was not statistically significant for the reduction in visits.

We did find that people are more concerned with the loss of jobs and the pollution than the number of visiting tourists or cruise ships. People are on average not willing to pay for a reduction in jobs with a WTP of negative 1948NOK for a high reduction in the number of employed people. They are also willing to pay 1187NOK for a high reduction (30%) in pollution from the ships. For politicians this means that the externalities, like employment and pollution are far more important than the number for visitors to the city.

Our findings are consistent with other research done with regards to economic activity. Residents are concerned with upholding the employment level sustained by the tourists visiting the city, and are keen to expand the economic contribution (Brida et al., 2012, 2011; Diedrich, 2010). As Diedrich (2010) and Brida et al. (2011) also found, residents are concerned with pollution stemming from the industry, and are willing to pay for a reduction.

We did not, as others have found, find any proof that exposure to the cruise ships or tourists significantly change preferences regarding the industry (Dugstad et al., 2019; Stewart et al., 2011). But we did find indications that framing plays a role in stated preference experiments (Camilleri & Larrick, 2014; Kragt & Bennett, 2012; Payne et al., 1992; Veldwijk et al., 2016)

Previous research has also found that residents are concerned that their voice might not be heard from the local authorities, and that such a relationship must exist to ease tensions between residents and the industry (Johnson, 2002; Ritchie & Inkari, 2006; Simpson & Bretherton, 2009). Respondents in our survey reported that they thought the results from the survey might be used by local authorities, giving a weak indication that the residents feel that their voice is heard.

Given the results from our analysis we cannot recommend the local authorities to restrict or reduce future cruise ship traffic to the Stavanger area, since the residents in our survey did not have a unified preference for such a reduction or restriction. We can however say that the residents do care about upholding and expanding the number of jobs in the region, and are concerned for the environment, in both cases we found a significant willingness to pay to uphold jobs and reduce emissions related to the industry. Our recommendation to local authorities is to focus on these areas. Representatives from Stavanger municipality and Stavanger harbor received this paper before publication.

For future research, we hope that the work we have put into designing and implementing a DCE with framing techniques inspires others to do the same. Especially now after a major shift in global tourism it is important to elicit local preferences for the industry. Future researchers looking into this issue can overcome most of the issues we faced by working to distribute the survey better.

9 References

- Amuquandoh, F. E. (2010). Residents' perceptions of the environmental impacts of tourism in the Lake Bosomtwe Basin, Ghana. *Journal of Sustainable Tourism, 18*(2), 223–238. <https://doi.org/10.1080/09669580903298531>
- Andriotis, K., & Vaughan, R. D. (2003). Urban Residents' Attitudes toward Tourism Development: The Case of Crete. *Journal of Travel Research, 42*(2), 172–185. <https://doi.org/10.1177/0047287503257488>
- Brida, J. G., Del Chiappa, G., Meleddu, M., & Pulina, M. (2012). Cruise Tourism Externalities and Residents' Support: A Generalized Ordered Logit Analysis. *Economics Discussion Paper, (2012–5)*. <http://dx.doi.org/10.2139/ssrn.1994246>
- Brida, J. G., Riaño, E., & Aguirre, S. Z. (2011). Residents' attitudes and perceptions towards cruise tourism development: A case study of Cartagena de Indias (Colombia). *Tourism and Hospitality Research, 11*(3), 181–196. <https://doi.org/10.1177/1467358411415153>
- Brida, J. G., & Zapata Aguirre, S. (2010). Cruise tourism: Economic, socio-cultural and environmental impacts. *International Journal of Leisure and Tourism Marketing, 1*(3), 205–226. Retrieved from Scopus.
- Camilleri, A. R., & Larrick, R. P. (2014). Metric and Scale Design as Choice Architecture Tools. *Journal of Public Policy & Marketing, 33*(1), 108–125. <https://doi.org/10.1509/jppm.12.151>
- Diedrich, A. (2010). Cruise ship tourism in Belize: The implications of developing cruise ship tourism in an ecotourism destination. *Ocean & Coastal Management, 53*(5), 234–244. <https://doi.org/10.1016/j.ocecoaman.2010.04.003>
- Dugstad, A., Grimsrud, K., Kipperberg, G., Lindhjem, H., & Navrud, S. (2019). *Acceptance of National Wind Power Development and Exposure – A Case-Control Choice Experiment Approach*. Unpublished.
- Dwyer, L., & Forsyth, P. (1998). Economic significance of cruise tourism. *Annals of Tourism Research, 25*(2), 393–415. [https://doi.org/10.1016/S0160-7383\(97\)00098-4](https://doi.org/10.1016/S0160-7383(97)00098-4)
- Dwyer, L., & Forsyth, P. J. (1996). Economic impacts of cruise tourism in Australia. *Journal of Tourism Studies, 7*(2), 36–43.

- Dybedal, P. (2019). *Cruiseturisters forbruk i Norge – en sammenlikning av resultater og metoder i ti undersøkelser* (TØI Report No. 1702/2019). Retrieved from <https://www.toi.no/getfile.php?mmfileid=50618>
- Dybedal, P., Farstad, E., Winther, P.-E., & Landa-Mata, I. (2018). *Cruisetrafikk til norske havner—Oversikt, utvikling og prognoser 2018-2060* (TØI Report No. 1651/2018). Retrieved from <https://www.toi.no/getfile.php?mmfileid=48981>
- Dybedal, P., & Haukeland, J. V. (2017). *Besøksforvaltning og lokalsamfunnsutvikling i verdensarvområdene Nærøyfjorden og Geirangerfjorden* (TØI Report No. 1585/2017). Oslo.
- Dybedal, P., Rideng, A., Haukeland, J. V., & Grue, B. (2006). *Utenlandske turistenes forbruk i Norge 2005* (TØI Report No. 823/2006). Retrieved from Transportøkonomisk institutt website: <https://www.toi.no/getfile.php?mmfileid=3311>
- Dyer, P., Gursoy, D., Sharma, B., & Carter, J. (2007). Structural modeling of resident perceptions of tourism and associated development on the Sunshine Coast, Australia. *Tourism Management, 28*(2), 409–422. <https://doi.org/10.1016/j.tourman.2006.04.002>
- Frafjord, S. (2017). Mytene om cruisetrafikken. *Rosenkilden, 23*(9), 6–12.
- Gibson, P., & Bentley, M. (2007). A Study of Impacts—Cruise Tourism and the South West of England. *Journal of Travel & Tourism Marketing, 20*(3–4), 63–77. https://doi.org/10.1300/J073v20n03_05
- Gursoy, D., Chi, C. G., & Dyer, P. (2009). An examination of locals' attitudes. *Annals of Tourism Research, 36*(4), 723–726. <https://doi.org/10.1016/j.annals.2009.06.003>
- Gursoy, D., & Rutherford, D. G. (2004). Host attitudes toward tourism: An Improved Structural Model. *Annals of Tourism Research, 31*(3), 495–516. <https://doi.org/10.1016/j.annals.2003.08.008>
- Hole, A. R. (2007). Fitting mixed logit models by using maximum simulated likelihood. *The Stata Journal, 7*(3), 388–401.
- Hole, A. R., & Kolstad, J. R. (2012). Mixed logit estimation of willingness to pay distributions: A comparison of models in preference and WTP space using data from a health-related choice experiment. *Empirical Economics, 42*(2), 445–469. <https://doi.org/10.1007/s00181-011-0500-1>

- Hritz, N., & Cecil, A. K. (2008). Investigating the Sustainability of Cruise Tourism: A Case Study of Key West. *Journal of Sustainable Tourism*, 16(2), 168–181.
<https://doi.org/10.2167/jost716.0>
- Jakobsen, E. W., & Dombu, S. V. (2018). *Reiselivsnæringens verdi* (Menon Economics Report No. 104/2018). Retrieved from
<https://www.nhoreiseliv.no/contentassets/7c0f264418d84b3ab309a43e7fa9ef75/reiselivsnaringens-verdi-2018.pdf>
- Jamal, T., & Getz, D. (1999). Community Roundtables for Tourism-related Conflicts: The Dialectics of Consensus and Process Structures. *Journal of Sustainable Tourism*, 7(3–4), 290–313. <https://doi.org/10.1080/09669589908667341>
- Johnson, D. (2002). Environmentally sustainable cruise tourism: A reality check. *Marine Policy*, 26(4), 261–270. [https://doi.org/10.1016/S0308-597X\(02\)00008-8](https://doi.org/10.1016/S0308-597X(02)00008-8)
- Johnston, R. J., Boyle, K. J., Adamowicz, W. (Vic), Bennett, J., Brouwer, R., Cameron, T. A., ... Vossler, C. A. (2017). Contemporary Guidance for Stated Preference Studies. *Journal of the Association of Environmental and Resource Economists*, 4(2), 319–405.
<https://doi.org/10.1086/691697>
- Jupskås, S. H. (2019, June 25). Spår kraftig vekst i cruisetrafikken i Stavanger. *Stavanger Aftenblad*. Retrieved from <https://www.aftenbladet.no/>
- Kibicho, W. (2008). Community-based Tourism: A Factor-Cluster Segmentation Approach. *Journal of Sustainable Tourism*, 16(2), 211–231. <https://doi.org/10.2167/jost623.0>
- Kim, Y., Kling, C. L., & Zhao, J. (2015). Understanding behavioral explanations of the WTP-WTA divergence through a neoclassical lens: Implications for environmental policy. *The Annual Review of Resource Economics*, 7. <https://doi.org/10.1146/annurev-resource-100913-012501>
- Ko, D.-W., & Stewart, W. P. (2002). A structural equation model of residents' attitudes for tourism development. *Tourism Management*, 23(5), 521–530.
[https://doi.org/10.1016/S0261-5177\(02\)00006-7](https://doi.org/10.1016/S0261-5177(02)00006-7)
- Kragt, M. E., & Bennett, J. W. (2012). Attribute Framing in Choice Experiments: How Do Attribute Level Descriptions Affect Value Estimates? *Environmental and Resource Economics*, 51(1), 43–59. <https://doi.org/10.1007/s10640-011-9487-5>

- Krinsky, I., & Robb, A. L. (1986). On Approximating the Statistical Properties of Elasticities. *The Review of Economics and Statistics*, 68(4), 715–719.
<https://doi.org/10.2307/1924536>
- Lancaster, K. J. (1966). A New Approach to Consumer Theory. *Journal of Political Economy*, 74(2), 132–157. <https://doi.org/10.1086/259131>
- Larsen, S., & Wolff, K. (2016). Exploring assumptions about cruise tourists' visits to ports. *Tourism Management Perspectives*, 17, 44–49.
<https://doi.org/10.1016/j.tmp.2015.12.001>
- Larsen, S., Wolff, K., Marnburg, E., & Øgaard, T. (2013). Belly full, purse closed: Cruise line passengers' expenditures. *Tourism Management Perspectives*, 6, 142–148.
<https://doi.org/10.1016/j.tmp.2013.02.002>
- Lepp, A. (2008). Attitudes Towards Initial Tourism Development in a Community With No Prior Tourism Experience: The Case of Bigodi, Uganda. *Journal of Sustainable Tourism*, 16(1), 5–22. <https://doi.org/10.2167/jost630.0>
- Long, V., & Wall, G. (1996). Successful tourism in Nusa Lembongan, Indonesia? *Tourism Management*, 17(21), 43–50. [https://doi.org/10.1016/0261-5177\(95\)00099-2](https://doi.org/10.1016/0261-5177(95)00099-2)
- Mangham, L. J., Hanson, K., & McPake, B. (2009). How to do (or not to do) ... Designing a discrete choice experiment for application in a low-income country. *Health Policy and Planning*, 24(2), 151–158. <https://doi.org/10.1093/heapol/czn047>
- McFadden, D. (1974). Conditional logit analysis of qualitative choice behavior. In P. Zarembka (Ed.), *Frontiers in Econometrics*. New York: Academic Press.
- McGehee, N. G., & Andereck, K. L. (2004). Factors Predicting Rural Residents' Support of Tourism. *Journal of Travel Research*, 43(2), 131–140.
<https://doi.org/10.1177/0047287504268234>
- Meyerhoff, J., & Liebe, U. (2006). *Status-Quo Effect in Choice Modeling: Protest Beliefs, Attitudes, and Task Complexity* (p. 21).
- Mohsin, A. (2005). Tourist attitudes and destination marketing—The case of Australia's Northern Territory and Malaysia. *Tourism Management*, 26(5), 723–732.
<https://doi.org/10.1016/j.tourman.2004.03.012>
- Nicholson, W., & Snyder, C. (2016). *Microeconomic Theory: Basic Principles and Extensions* (12th ed.). Retrieved from <https://www.cengage.co.uk/books/>

- Østebø, J. (2019, September 9). Lite forurensning fra cruiseskip. *Stavanger Aftenblad*. Retrieved from <https://www.aftenbladet.no/>
- Øvrebø, O. A. (2019, December 5). Klimagassutslipp per innbygger i Norge og verden – Klimavakten. Retrieved 2 February 2020, from Energi og Klima website: <https://energiogklima.no/klimavakten/utslipp-per-innbygger/>
- Payne, J. W., Bettman, J. R., & Johnson, E. J. (1992). Behavioral decision research: A constructive processing perspective. *Annual Review of Psychology*, *43*, 87–131. <https://doi.org/10.1146/annurev.ps.43.020192.000511>
- Pérez, E. A., & Nadal, J. R. (2005). Host community perceptions: A cluster analysis. *Annals of Tourism Research*, *32*(4), 925–941. <https://doi.org/10.1016/j.annals.2004.11.004>
- Perman, R., Ma, Y., McGilvray, J., & Common, M. (Eds.). (2003). *Natural resource and environmental economics* (3rd ed.). Essex: Pearson Education Limited.
- Pindyck, R. S., & Rubinfeld, D. L. (2015). *Microeconomics* (8. ed., global ed., p. 739). Boston, Massachusetts: Pearson.
- Pizam, A. (1978). Tourism's Impacts: The Social Costs to the Destination Community as Perceived by Its Residents. *Journal of Travel Research*, *16*(4), 8–12. <https://doi.org/10.1177/004728757801600402>
- Revelt, D., & Train, K. (1998). Mixed Logit with Repeated Choices: Households' Choices of Appliance Efficiency Level. *The Review of Economics and Statistics*, *80*(4), 647–657. <https://doi.org/10.1162/003465398557735>
- Ritchie, B. W., & Inkari, M. (2006). Host community attitudes toward tourism and cultural tourism development: The case of the Lewes District, southern England. *International Journal of Tourism Research*, *8*(1), 27–44. <https://doi.org/10.1002/jtr.545>
- Schubert, S. F. (2009). *Coping with Externalities in Tourism—A Dynamic Optimal Taxation Approach* (SSRN Scholarly Paper No. ID 1416103). <https://doi.org/10.2139/ssrn.1416103>
- Seeberg, A. A. R., Haugland, L. M., Løge, T., Aalen, P., & Jakobsen, E. (2018). *Cruiseturismens økonomiske betydning i Bergen* (Menon Economics report No. 85/2018). Retrieved from <https://www.menon.no/wp-content/uploads/2018-85-Cruiseturismens-%C3%B8konomiske-betydning-i-Bergen.pdf>
- Sheldon, P. J., Var, T., & Var, T. (1984). Resident attitudes to tourism in North Wales. *Tourism Management*, *5*(1), 40–47. [https://doi.org/10.1016/0261-5177\(84\)90006-2](https://doi.org/10.1016/0261-5177(84)90006-2)

- Simpson, K., & Bretherton, P. (2009). The Impact of Community Attachment on Host Society Attitudes and Behaviours Towards Visitors. *Tourism and Hospitality Planning & Development*, 6(3), 235–246. <https://doi.org/10.1080/14790530903363431>
- Smith, M. D., & Krannich, R. S. (1998). Tourism dependence and resident attitudes. *Annals of Tourism Research*, 25(4), 783–802. [https://doi.org/10.1016/S0160-7383\(98\)00040-1](https://doi.org/10.1016/S0160-7383(98)00040-1)
- Stavangerregionen Havn IKS. (2020). Godt fordelte cruiseanløp i 2020. Retrieved from <https://www.stavangerhavn.no/category/cruise/>
- Stewart, E. J., Dawson, J., & Draper, D. (2011). Cruise Tourism and Residents in Arctic Canada: Development of a Resident Attitude Typology. *Journal of Hospitality and Tourism Management*, 18(1), 95–106. <https://doi.org/10.1375/jhtm.18.1.95>
- THEMA Consulting Group. (2020). *Klimagassutslipp og mulige tiltak i Sør- Rogaland* (No. 2019–14). Retrieved from <https://www.lysekonsern.no/getfile.php/1320035-1578904354/Dokumenter/Publikasjoner%20%28Lysenytt%2C%20Lyse%20Sider%29/Klimarapporten.pdf>
- Train, K. (2000). Halton Sequences for Mixed Logit. *UC Berkeley: Department of Economics*. Retrieved from <https://escholarship.org/uc/item/6zs694tp>
- Train, K. E. (2009). *Discrete choice methods with simulation*. Cambridge university press.
- Veldwijk, J., Essers, B. A. B., Lambooi, M. S., Dirksen, C. D., Smit, H. A., & de Wit, G. A. (2016). Survival or Mortality: Does Risk Attribute Framing Influence Decision-Making Behavior in a Discrete Choice Experiment? *Value in Health*, 19(2), 202–209. <https://doi.org/10.1016/j.jval.2015.11.004>
- Wattoe, S. (2014). *Cruise Sommeren 2014: Turistundersøkelsen* [Innovasjon Norge Report]. Retrieved from <https://www.innovasjon norge.no/globalassets/reiseliv/turistundersokelsen---cruiserapport---siste.pdf>
- Zeng, T. (2016). Using Halton Sequences in Random Parameters Logit Models. *Journal of Statistical and Econometric Methods*, 5(1), 1–4.

Appendices

Appendix 1 – Example of the choice sets presented to survey respondents

	Status quo	Alternative 1:	Alternative 2:
Number of tourists Per year 	770 000	540 000 (-30%)	655 000 (-15%)
Number of jobs In the tourist industry 	6800	6800 (0%)	4760 (-30%)
Pollution Per person, per day 	30kg CO ₂ 2 times as much as the average citizen	-10% (27kg CO ₂)	0% (30kg CO ₂)
Taxes payable Change in yearly tax 	No change	Pay 2400kr MORE tax every year	Pay 1800kr MORE tax every year

Status Quo



Alternative 1



Alternative 2



	Status quo	Alternative 1:	Alternative 2:
Number of ships Per year 	350	350 (0%)	245 (-30%)
Number of jobs In the tourist industry 	6800	6800 (0%)	4760 (-30%)
Pollution Per person, per day 	30kg CO ₂ 2 times as much as the average citizen	-20% (24kg CO ₂)	0% (30kg CO ₂)
Taxes payable Change in yearly tax 	No change	Pay 1800kr MORE tax every year	Pay 2400kr MORE tax every year

Status Quo



Alternative 1



Alternative 2



Appendix 2 – Example of the survey as presented to respondents

This survey example is of the ship variant. Meaning it frames the first attribute as the number of ships.

Introduction

Survey about cruise ship tourism in the Stavanger area. How Stavanger as a community perceive cruise ship tourism to the area is not well understood. Thus, it is important for the local authorities and businesses to get a better understanding of what you think about this topic.

We are interested in hearing how you personally experience cruise ship tourism to the area. Both with regards to how the tourists themselves affect you, but also what other effects they might have on the area in general. This survey will take around 10 minutes to complete. Your participation is voluntary, and you can at any point exit the survey. All the answers given in this survey will be anonymous and cannot be traced back to you. The data will be stored according to guidelines.

The results from this survey may be published in a scientific journal, distributed to local authorities, administrative agencies, and the general population in Stavanger. By proceeding beyond this point, and answering the questions, you have agreed to participate in this survey.

This survey is conducted by Dan-Tormod Bergem and Henrik Knudsen as part of a master thesis being written at the Business School at the University of Stavanger. If you have any questions related to this survey, or what it is going to be used for, please contact he.knudsen@stud.uis.no

Du kan velge mellom "Norsk" eller "Engelsk" øverst i høyre hjørne.

Some background information

Stavanger hosted 234 cruise ship arrivals in 2019. Each ship had on average around 2000 cruise tourists on board, which amounts to 454 000 cruise tourists in total for 2019. According to current policy proposals we estimate that the city will host some 350 ships, and 770 000 cruise ship tourists, in 2025. The city will facilitate this by building capacity for larger ships near

Bjergsted. The plan is to keep the current restriction of maximum 4 ships per day and focus on expanding ship arrivals throughout the year. Recently there has been more talk about how the industry affects the city, both environmentally and economically.

The following factors may shape how you perceive cruise tourism:

1. The number of cruise ship arrivals

Based on the current prognosis, under current legislation and tourist demands, Stavanger will host around 350 cruise ships arrivals in 2025. However, this will depend on how the local authorities regulate and facilitate demand for visits.

2. The number of jobs

The tourism industry supports several jobs in hospitality, transport, food and guided experiences. Today the tourism industry supports 5700 jobs in Stavanger, and under current conditions, this is expected to grow to around 6800 by 2025.

If the number of cruise tourists is reduced, it will most likely result in lower demand for local products and services. This could have a negative effect on the number of employees in the tourism industry. Better services and attractions onboard the cruise ships could also result in lower demand for local services and products in Stavanger. So, it is possible that number of employees in the tourism industry are reduced, even if the number of cruise tourists remains constant. This illustrates the importance of cooperation between the cruise lines and local authorities.

3. Pollution

Recent pollution measurements taken in Stavanger indicates that the cruise ship traffic does not affect local air quality, but it can still emit greenhouse gasses. The estimated carbon emissions per cruise tourist in 2025 is on average 30kg CO₂ per day they are in Stavanger. This is approximately two times more than the average person living in the area.

As of this year 1 in 5 visits will be conducted by a new LNG ship, which will reduce emissions of CO₂ by around 2%. In the future it is also expected that more ships will arrive using alternative fuels. Stavanger port authorities was also the first port in Norway to implement differentiated docking fees to encourage greener ships. As of this year the cruise lines can

receive a 17,5% discount if they achieve certain emission targets, while they will get an extra fee of 150% if they pollute too much. The port is also working towards building shore power to reduce emissions while the ships are docked, this is estimated to cost around 100 million NOK per docking station. The size of the cruise ships, regulations, and technological changes could affect the average emissions per cruise tourist. How the local authorities prioritize these changes will affect how quickly we will see a reduction in CO2 emissions from the industry.

4. Taxes payable

In 2018, it is estimated that Stavanger municipality received around 166 million NOK in personal income taxes by people employed directly in tourism related industry. Including other indirect revenues, the municipality tax income from tourism industry is higher. The city also has expenditures related to building and maintaining existing berths, building shore power and other environmental efforts. Certain efforts to change the cruise ship tourism industry may therefore affect the municipalities balance sheet, meaning you personally might have to cover missing income.

Your opinion about cruise ship tourism

The current prognosis, of 350 cruise ship arrivals per year in 2025, is described as a "status quo" indicating that this is the likely scenario if no policy measures are taken to alter the regulations.

Alternative scenarios

Depending on the different actions taken by the local authorities, the outcomes experienced by the local community would change.

In the following 6 questions, you will be presented with THREE alternatives. One of the alternatives is the "status quo" representing the current course. The other two scenarios describe the state of affairs in 2025 when different actions are taken. After comparing the three alternative scenarios, please select the alternative that you would like to happen.

Below is an illustration of how the next 6 questions are structured, and how you will complete this part of the survey.

	Status quo	Alternative 1:	Alternative 2:
Number of ships Per year 	350		
Number of jobs In the tourist industry 	6800		
Pollution Per person, per day 	30kg CO ₂ 2 times as much as the average citizen		
Taxes payable Change in yearly tax 	No change		

Choose your preferred alternative

Status Quo Alternative 1 Alternative 2

Status quo will remain a fixed alternative in all the choice sets

The numbers here will vary randomly and independently

Each alternative will present different levels of the 4 factors we have described earlier:

1. The number of ship arrivals
2. The number of jobs
3. Pollution
4. Taxes payable

These factors will vary across the different alternatives. Please consider how the changes in tax levels would affect your personal economic situation.

Choice sets

Choice 1

	Status quo	Alternative 1:	Alternative 2:
Number of ships Per year 	350	245 (-30%)	300 (-15%)
Number of jobs In the tourist industry 	6800	6800 (0%)	4760 (-30%)
Pollution Per person, per day 	30kg CO ₂ 2 times as much as the average citizen	-10% (27kg CO ₂)	0% (30kg CO ₂)
Taxes payable Change in yearly tax 	No change	Pay 2400kr MORE tax every year	Pay 1800kr MORE tax every year

Status Quo

Alternative 1

Alternative 2

Choice 2

	Status quo	Alternative 1:	Alternative 2:
Number of ships Per year 	350	350 (0%)	245 (-30%)
Number of jobs In the tourist industry 	6800	5780 (-15%)	4760 (-30%)
Pollution Per person, per day 	30kg CO ₂ 2 times as much as the average citizen	-10% (27kg CO ₂)	0% (30kg CO ₂)
Taxes payable Change in yearly tax 	No change	Pay 3000kr MORE tax every year	Pay 1800kr MORE tax every year

Status Quo

Alternative 1

Alternative 2

Choice 3

	Status quo	Alternative 1:	Alternative 2:
Number of ships Per year 	350	350 (0%)	300 (-15%)
Number of jobs In the tourist industry 	6800	4760 (-30%)	6800 (0%)
Pollution Per person, per day 	30kg CO ₂ 2 times as much as the average citizen	-10% (27kg CO ₂)	0% (30kg CO ₂)
Taxes payable Change in yearly tax 	No change	Pay 3000kr MORE tax every year	Pay 2400kr MORE tax every year

Status Quo

Alternative 1

Alternative 2

Choice 4

	Status quo	Alternative 1:	Alternative 2:
<p>Number of ships Per year</p> 	350	245 (-30%)	350 (0%)
<p>Number of jobs In the tourist industry</p> 	6800	5780 (-15%)	6800 (0%)
<p>Pollution Per person, per day</p> 	30kg CO ₂ 2 times as much as the average citizen	-20% (24kg CO ₂)	-10% (27kg CO ₂)
<p>Taxes payable Change in yearly tax</p> 	No change	Pay 2400kr MORE tax every year	Pay 1200kr MORE tax every year

Status Quo

Alternative 1

Alternative 2

Choice 5

	Status quo	Alternative 1:	Alternative 2:
Number of ships Per year 	350	350 (0%)	245 (-30%)
Number of jobs In the tourist industry 	6800	4760 (-30%)	6800 (0%)
Pollution Per person, per day 	30kg CO ₂ 2 times as much as the average citizen	-20% (24kg CO ₂)	-10% (27kg CO ₂)
Taxes payable Change in yearly tax 	No change	Pay 2400kr MORE tax every year	Pay 1200kr MORE tax every year

Status Quo

Alternative 1

Alternative 2

Choice 6

	Status quo	Alternative 1:	Alternative 2:
Number of ships Per year 	350	300 (-15%)	245 (-30%)
Number of jobs In the tourist industry 	6800	4760 (-30%)	5780 (-15%)
Pollution Per person, per day 	30kg CO ₂ 2 times as much as the average citizen	-20% (24kg CO ₂)	0% (30kg CO ₂)
Taxes payable Change in yearly tax 	No change	Pay 1200kr MORE tax every year	Pay 1800kr MORE tax every year

Status Quo	Alternative 1	Alternative 2
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On a scale from 1 to 5, how important were the different attributes when you made your selection between the different scenarios?

	1 = not important	2	3	4	5 = Very important	Don't know
Number of ships	<input type="radio"/>					
Number of employees	<input type="radio"/>					
Pollution	<input type="radio"/>					
Taxes payable	<input type="radio"/>					

Questions about COVID-19

Would you say that the answers you have given were influenced by the current situation with COVID-19 infection risks?

- Yes
- No
- Unsure

Would you like to explain how the situation influenced your choices?

- No
- Yes, _____

Socio-economic characteristics

You have now completed the main part of the survey, and we would like to get some background information about yourself and your household

What is your age?

- _____

What is your postcode? (This will be used to approximate how close to downtown Stavanger you live)

- _____

Gender

- Male
- Female
- Prefer not to say

Have you been, or plan to go, on a cruise vacation?

- Yes
- No
- Prefer not to say

On a scale of 1 to 5, what is your opinion regarding continued cruise ship tourism?

- | | | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------------------|
| 1 = Very
negative | 2 = Negative | 3 = Neutral | 4 = Positive | 5 = Very
positive | Don't
know/prefer
not to say |
| <input type="radio"/> |

Has your attitude towards cruise ship tourism changed recently, especially regarding the current situation with COVID-19?

- | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|
| More
negative | No change | More
positive | Unsure |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

In your opinion, what is Stavanger Municipality's most important task related to the cruise ship industry?

- Environmental protection
- Facilitate economic growth
- Reduce local air pollution
- Build land-based power
- Force ships to run on LNG or other environmental alternatives
- Reduce the total number of ships
- Reduce the total number of passengers
- Other, please specify _____

On average, how many days per week are you in downtown Stavanger?

- All the days (7 days)
- Most (5-6 days)
- Often (3-4 days)
- Some days (1-2)
- Rarely (less than once)
- Never
- Only passing through

How many of these times have there been cruise ships present?

- All the times (100%)
- Most of the times (over 80%)
- Often (over 50%)
- Some of the times (under 50%)
- Rarely (under 10%)
- Never
- Don't know

Are you a member of an outdoor activity organization or an environmental protection organization?

- Yes
- No
- Don't know/prefer not to say

What is the highest degree you have received? (Norwegian standards)

- Elementary (7-10years)
- High School (13 years)
- Trade school/Vocational education (14 years)
- 3-4 year university education (bachelor/cand.mag.)
- 5 year university education (masters)
- PhD/doctorate
- Unsure/ prefer not to say

Are you, or someone in your immediate family directly employed in the tourism industry?

- Yes
- No
- Don't Know

Please give us an estimate of your annual salary before tax in 2019

- Up to 200,000kr
- 200,001 - 400,000kr
- 400,001 - 600,000kr
- 600,001 - 800,000kr
- 800,001 - 1,000,000kr
- 1,000,001 - 1,200,000kr
- 1,200,001 - 1,400,000kr
- 1,400,001 - 1,600,000kr
- 1,600,001 - 1,800,000kr
- 1,800,001 - 2,000,000kr
- 2,000,001 - 2,200,000kr
- 2,200,001 - 2,400,000kr
- 2,400,001 - 2,600,000kr
- 2,600,001 - 2,800,000kr
- 2,800,001 - 3,000,000kr
- More than 3,000,000kr
- Prefer not to say
- Don't know

Do you expect your annual salary in 2020 to change because of Covid-19?

- Lower
- Unchanged
- Higher
- Unsure

Do you think the results from this survey will be used by the local authorities to influence policy related to future cruise ship tourism?

- Yes
- No
- Don't know

Do you think you might have to pay more tax if the local authorities would put more emphasis on the environment, by for instance reducing cruise ship tourism in the area, or by enacting stricter regulations?

- Yes
- No
- Don't know

You are done - do you have any more you would like to add about the survey or the topic?

- No
- Yes, please specify _____