

The Oil Price Collapse and the Birth of a Tourist Nation

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Abstract

In this paper, we have estimated hotel revenue functions at the regional level in Norway. The purpose is to investigate the effects of the oil price collapse on tourism demand. The oil industry is a dominant economic sector in Norway. Its high demand for economic resources has inflated the general price level nationally. A side effect is that the Norwegian tourism industry has struggled with poor price competitiveness. We find the downfall in oil revenues caused by the fall in crude oil prices has boosted tourism growth through a weakening of the local currency, Norwegian kroner. This result suggests that a subset of rich countries where wealth inflate prices of tourism services can have problem in developing its tourism industry.

Key words: Oil price, tourism, exchange rate, price competitiveness, Norway

Introduction

Price competitiveness is regarded as the most important economic influence on tourist destination choice (Dwyer, Forsyth, & Rao, 2000). Vacationers often need to dig deep in their pockets before packing suitcases, which makes it a key ingredient for the successful tourist destination to be price competitive (Assaf & Alexander, 2011; Culiuc, 2014; Dwyer, Forsyth, & Rao, 2000). Since international tourists measure their real costs in their own currency rather than the destination's currency, price competitiveness is adjusted by the exchange rate (Dwyer, Forsyth, & Rao, 2000, 2002). Earlier studies find the price elasticity of inbound tourism demand tends to be slightly above unity (Peng, Haiyan, Geoffrey, & Stephen, 2014). This implies a ten percent strengthening of a destination currency reduces inbound tourism demand by more than ten percent. While the role of relative prices among competing tourism destinations is widely understood, the causes of price differences are seldom discussed except for the study given by Dwyer, Forsyth and Rao (2002). This is likely because tourism studies focus on tourism while the price level in a destination is largely determined outside the tourism sectors.

Following this reasoning, the main objective of our study is to question if the 'birth of a tourist nation' can come about quite accidentally because of what happens in other parts of the destination economy. Specifically, we look at the growing price competitiveness of the tourism industry in Norway resulting from economic recession and weakening local currency, Norwegian krone (NOK) caused by the global oil price fall ((H. Bjornland & Thorsrud, 2014). These events linked to the fall in the oil price in 2014 are associated with a 24% increase in the number of tourists' hotel guest nights in Norway from 2014 to 2016 (Statistic Norway, 2017). Our study differs from Dwyer, Forsyth and Rao (2002) by estimating how a destination's price competitiveness is affected by a non-tourism sector in a country. More specifically, this case study of the Norwegian tourism industry gives a small 'laboratory' to

estimate effects of changes in a non-tourism sector – the domestic oil industry - on tourism demand through its impact on exchange rates and GDP.

To analyze this freeing-up-of-economic-resources effects (i.e., the opposite of crowding-out effects), we estimate revenue functions of the hotel sector in Norway with regional effects. The regional effects are relevant since the oil slump's effect on tourism demand varies regionally due to the uneven spatial distribution of the oil industry throughout the country. In addition, we compile different descriptive statistic for the Norwegian macro economy and for tourist development like the cruise sector, which is an important part of tourism in Norway.

The present study makes several contributions. First, this study is the first to estimate how development of tourism industry is affected by non-tourism sectors in the same country. Second, this study is the first to show that a handicap for a country's tourism competitiveness can be not only being "too" poor (Eugenio-Martin, Martin-Morales, & Sinclair, 2008; Ivanov & Webster, 2013; Yap & Saha, 2013), but also being 'too' rich because of its inflationary effect on the destination's price level. Third, from the previous point it follows that a recession may boost tourism at the same time as the economic situation in a country deteriorates. Hence, tourism development is not always associated with economic growth as discussed in most of tourism literature.

The paper starts by discussing literature on tourism destination competitiveness before providing background to our case study on the Norwegian oil industry's effect on the tourism industry. Next, we develop the hypotheses to be tested, present the data and research methods. Finally, we present and discuss the empirical findings of the model results. The paper concludes with a discussion of main findings and limitations.

Background /literature review

Many studies explain the establishment of a competitive tourist destination using different models of the tourist 'ecosystem' (Crouch & Ritchie, 2000; Crouch, 2010; Dwyer & Kim, 2003). These models point out key factors that distinguish the successful from the unsuccessful and provide roadmaps to fellow researchers and destination managers who are interested in the study and management of destinations. Although the relative importance of economic, infrastructure and institutional factors has been widely studied in the literature (Eugenio-Martin et al., 2008; Ivanov & Webster, 2013), little is said about how tourism development hinges on other sectors of the economy. Some studies point out that the successful tourism destination will thrive on the same infrastructure (e.g. transport, hospitality, health) (Masson & Petiot, 2009) and institutions (e.g. rule of law, safety) (Assaf & Alexander, 2011; Levantis & Azmat, 2000; Yap & Saha, 2013) as other economic sectors. Most of the literature only inadvertently address the role of competition for economic resources between tourism and non-tourism sectors through the discussion of prices, exchange rates and GDP. For instance, in accordance with standard economic theory, tourism demand studies assume that travel decisions are a function of price, income and exchange rate (Crouch, 1992; Song & Witt, 2000).

In the literature, there is also a particular focus on how developing countries can improve competitiveness by addressing shortcomings in tourism infrastructure, accessibility and institutional factors etc. (Eugenio-Martin et al., 2008; Ivanov & Webster, 2013; Yap & Saha, 2013) and how tourism growth can spur economic growth (Lee & Chang, 2008). In reality, not only poor countries have challenge with tourism growth, but also a few rich countries might struggle because of too high price level. In that case, a recession in a country may boost tourism growth since the recession makes price levels in the country decrease. In this case, tourism growth is not associated with economic growth. In the following, we focus

on the contraction of the locomotive in the Norwegian economy, the oil and gas sector, and its impact on tourism demand.

Oil's Dominance in the Norwegian Economy

The oil and gas industry is by far the largest exporting sector in Norway with positive productivity spillovers on other non-resource and non-traded sectors (Bjornland & Thorsrud, 2016; Torvik, 2001). During the last decades, oil and gas exports have made up around 50% of the total Norwegian export value. The oil and gas industry is also the largest contributor to the Norwegian GDP with a share around 20%. The co-movements of the GDP and the crude oil price mirror the Norwegian economy's oil dependency (Figure 1) and a correlation coefficient of 0.92 reflects the Norwegian GDP and the oil price are in close harmony.

Insert figure 1 here

Besides the oil price and the Norwegian GDP, the exchange rate is also included in figure 1. The exchange rate is measured as the Norwegian Krone (NOK) against the currencies of the top 10 tourist emitting countries (measured in quantity of overnight stays in Norwegian hotels). Because many international visitors come from EU countries, the exchange rate index is heavily weighted against Euro (45%). The other currencies included in the calculation are Swedish Krona, Danish Krone, British Pound, US dollar, Chinese Yuan and Japanese Yen. Although the oil price is more strongly correlated with GDP (correlation coefficient of 0.92) than with the exchange rate (0.38), the latter association is sufficiently strong to indicate that NOK depends on the oil price. This is also supported by the other studies that finds that the oil price improves forecasts of NOK (Akram, 2004; Ferraro, Rogoff,

& Rossi, 2012). In summary, the Norwegian economy reflected by the GDP and the NOK exchange rate, is intrinsically dependent on what happens in the global oil market.

Price Competitiveness of the Norwegian Tourism Industry

High oil price and corresponding high oil revenues prior to 2014 contributed to make Norway the most expensive country in the world based on cost of living index by Numbeo.com (2018)¹. Although this index is not a tourism price index, it mirrors destination Norway's price disadvantage. Figure 2 shows the cost of living index for Norway, its neighboring Nordic countries (Denmark, Finland, Iceland and Sweden) and the largest tourist destinations in Europe (Spain, France, Italy, Switzerland, UK and Germany) compared to the New York City (the base of the index).

In 2013, Norway's index was 174 suggesting it had an average price 74% higher than New York City, 60% higher than the largest destinations in Europe (by taking average of the index of these countries) and 53% higher than the Nordic countries. However, in 2016, Norway's index became much lower, *equal* to that of New York City and only 24 and 20% higher than that of the largest destinations in Europe and the Nordic countries, respectively. The dramatic reduction in the prices in Norway can be mainly attributed to the weakening of the Norwegian krone following the negative oil price shock. It suggests the depreciated Norwegian kroner has increased the relative price competitiveness of the Norwegian tourism industry.

Insert figure 2 here

¹ Numbeo.com is an online database of user generated price data. Cost of Living Index is defined as follows on their website: "Cost of Living Index (Excl. Rent) is a relative indicator of consumer goods prices, including groceries, restaurants, transportation and utilities. Cost of Living Index doesn't include accommodation expenses such as rent or mortgage."

Tourism Boom

The steep fall in the Norwegian krone after 2014 is illustrated in figure 3 together with tourists' hotel guest nights and the number of cruise passengers visiting the Norwegian fjords and coastal cities. Tourists are defined as those who travel primarily for leisure and holiday. The tourists' hotel guest nights include overnights of both international and domestic travelers, but exclude those who report business, courses and conference as the purpose of their stayovers. Figure 3 presents both the level of stayover nights in each year and its growth rate relative to the previous year. It shows that the drop in the exchange rate from 2014 to 2015 was followed by an increase in tourists' hotel guest nights by 13%. From 2013 to 2016 when the NOK was depreciated by 18%, the tourists' hotel guest nights increased by 25%.

In contrast, the number of international cruise passengers *fell* in both 2014 and 2015. The decoupling between destination currency and cruise demand is likely due to outsourcing of cruise services (e.g., accommodation, food, transportation): since cruise passengers incur most of their expenditures in their home currencies other than the destination's currency (Larsen, Wolff, Marnburg, & Øgaard, 2013), cruise passengers benefit much less from a weaker destination currency. If this is a correct assumption, the cheaper NOK has reduced the 'revenue leakage' to the international cruise industry by shifting demand from cruise to onshore hotels. This seems like a plausible explanation why the NOK is negatively correlated with hotel demand (correlation coefficient of -0.91) but positively related to cruise demand (correlation coefficient of 0.44) in the period between 2012 to 2016.

Norway as a Tourism Destination

Our focus on a few key economic factors in the study (i.e., GDP and exchange rate) do not mean we disregard the fact that tourism competitiveness relies on a broad spectrum of

factors, not least the presence of tourist attractions. Norway is well ‘equipped’ with attractions relative to its size. For example, the Norwegian fjords were included in the UNESCO World Heritage in 2004 and named the best unspoiled travel destination in the world in 2004 and 2009 by the National Geographic’s Traveler Magazine (Erfurt-Cooper, 2009; Hawkins, Chang, & Warnes, 2009). The Disney animation movie “Frozen” (released in December 2013) and the TV series “Vikings” (started to produce in 2013) have both created awareness and pull factors for Norway as a tourist destination (Beaumont-Thomas, 2014; Metcalf, Linnes, Agrusa, & Lema, 2015), likely reinforcing foreigners’ perception of Norway as exotic with key image associations like cold, dark, snow, mountain, Vikings and fjords (Prebensen, 2007). The increasing awareness of Norway’s natural attractions and cultural heritage has certainly contributed to growth in both the cruise and land tourism. At the same time, Norway has the hotel capacity required for hosting inbound tourists and a well-developed international air connectivity that is key to facilitate visits to a fringe destinations like Norway (Tveteras & Roll, 2013).

More generally, using a broad set of indicators of tourism competitiveness, Gooroochurn and Sugiyarto (2005) found that Norway was among the top five most competitive tourist destinations compared to over 200 other countries in the world. However, even if a destination has all the other desired characteristics to be competitive, travel cost will still choke demand if the price is too high compared to alternative destinations or if it simply exceeds peoples’ travel budgets. The World Economic Forum’s biannual Travel and Tourism Competitiveness Index better reflects the price competitiveness component due to repeated measurements over time. In 2013, Norway, ranked 22 globally, was perceived to be less competitive than the other Nordic countries, Denmark, Finland, Iceland and Sweden (Blanke & Chiesa, 2013). In 2017, Norway had climbed four places and was ranked above *all* the other Nordic countries (Crotti & Misrahi, 2017).

Given all the factors that favour Norway as a competitive tourism destination, it seems reasonable to assume that a significant improvement in price competitiveness resulting from a weakening of the Norwegian currency will contribute to the birth of Norway as a tourist nation. If that is the case, then it is the contraction of a non-tourism sector, the oil sector, that fosters the tourism growth.

Hypotheses

Since the hypothesis that the oil price fall has birthed a tourist nation is not directly testable, we proceed in a different manner to analyze the effects of the oil-driven recession. Total hotel overnight stays include different guest segments including tourists, course & conference and business travelers and they are all influenced by this recession. Therefore, we investigate how total hotel demand and, specifically, tourists' hotel demand have responded to the oil price fall. To disentangle the different effects of the fall in the crude oil price on hotel demand, we exploit the uneven spatial distribution of the oil industry across Norwegian regions.

The motivation is first to establish there is an oil-driven impact on the hotel industry. This helps to link the changes in the tourism sector to the changes in the non-tourism sector. A large part of the hotel demand in Western Norway is business travelers from the oil industry. The business travelers' hotel demand can be treated as a derived demand: travel is an input in the oil firms' (and other businesses') production functions. An abrupt reduction in oil revenue is likely to hit firms' travel budgets hard. Derived demand for hotel accommodation will be adjusted downwards according to the fall in both volume and value of its oil production. Likewise, since the Norwegian economy is dependent on the oil industry, a

fall in oil revenue means reduced household income and consequently decline in the domestic leisure travelers' hotel demand. This leads us to formulate the first hypothesis:

H1: The reduction in GDP due to the oil recession has greatly decreased the hotel demand in Western Norway, which has the greatest oil industry cluster.

Compared to the negative effects of the oil revenue and household income reductions, the subsequent weakening of the destination currency ought to have the opposite effect on hotel demand: first, a weaker currency makes it more expensive to travel abroad for both Norwegian businesses and households. Second, the relative strengthening of international tourists' own currencies relative to NOK makes it cheaper for international tourists to travel to Norway and thus increases the attractiveness of Norway as a holiday destination. Both effects are positive for hotel demand.

In the segment of the Norwegian domestic travelers, the negative income effect stemming from the GDP reduction is likely smaller in the tourists' hotel demand compared to business demand due to that business travels are directly impacted by the activity level in the oil industry and oil industry is dominant in the Norwegian economy. In the segment of international travelers, the international tourists' demand for hotel accommodation in Norway is unaffected by the Norwegian domestic oil recession. At the same time, the currency effect is unequivocally positive on all segments in contrast to the effect of the GDP reduction. This leads to the following hypothesis about the net effect of these two forces brought about by the oil price fall:

H2a): The overall effect of the oil price fall as manifested through reduced GDP and a weaker domestic currency on total hotel demand in Norway is positive.

The next and final hypothesis, H2b, reflects that the oil price reduction affects more strongly on demand from the domestic and international business community due to the

reduced activity level in the oil industry. In contrast, the income effect of the oil price fall only affects negatively the domestic tourism demand, but not inbound tourism demand.

Therefore, we have:

H2b): The overall effect of the oil price fall as manifested through reduced GDP and a weaker domestic currency is greater for tourists' hotel demand compared to the business and course & conference guest segments' hotel demand.

Data and research method

The Norwegian hotel data was obtained from the Statistics Norway (SSB) including an overnight stay dataset and a hotel price dataset. The overnight stay dataset includes the total number of overnight days in hotels and that only for holiday and leisure purpose, which we treat as tourist overnight stays in different Norwegian counties. Between 2005 and 2016, the average share of the hotel overnights stays pertaining to the tourist segment was 49%.

The hotel price dataset includes the average hotel prices in each county by month. Exchange rates were provided by the Norges Bank, the central bank of Norway (2017), and the consumer price index (CPI) and Gross Domestic Product (GDP) of the tourists' countries were obtained from the World Bank (2017). All the data are monthly except for the GDP that are quarterly. Since only quarterly GDP data is available, we have aggregated the other data to quarterly by taking average values in each quarter.

To estimate total inbound hotel demand, we need aggregate measures of income and exchange rates of the inbound hotel guests' source countries. We solve this by aggregating GDP and exchange rates for the ten largest source countries of inbound hotel guests to Norway weighted by the share of the total number hotel days for each source country. Note

that we also investigate domestic hotel guests' response to the oil price drop. In this case, domestic GDP is used as measure of the hotel guests' income.

The overnight stays were aggregated to six main regions according to the definition given by SSB, the capitol Oslo, Eastern Norway, Southern Norway, Western Norway, Central Norway and Northern Norway. This regional distribution also delineates naturally distinct tourism regions in Norway. For example, urban tourism will be more concentrated in the Oslo region, cruise tourism more heavily in the fjords of Western Norway and tourism related to Northern lights and the midnight sun in Northern Norway. The hotel price for each region is composed by the share-weighted average of the hotel price in each county that makes up the region. The shares are the percentage of overnight stays of each county in the region. The data is organized into a panel containing hotel overnight stays and hotel revenues in six regions over time period between quarter one 2005 to quarter three 2017.

Model

We start by formulating a basic tourism demand model based on income and prices (Song & Witt, 2000). The demand is measured by number of the overnight stays (Y_{it}) to region i in time t as a function of weighted GDP of top ten source countries, the weighted exchange rates (EX_t) between the currencies of top ten countries and Norway, the regional hotel price in Norway (HP_{it}) measured in Norwegian Krone (NOK). The function is presented as:

$$Y_{it} = f (GDP_t, EX_t, HP_{it}) \quad (1)$$

According to economic theory, demand is positively related to GDP (a measure of tourists' income) and negatively to exchange rate (when a unit of the destination currency is expressed in terms of the tourists' currencies) and hotel price. The oil price is not included

explicitly in the model, even if the objective of the study is to investigate its effect on tourists hotel demand. This is because of the high correlation between the oil price and the exchange rate as pointed out earlier. When highly correlated variables are included in the same model, there are problems of estimation instability and structural misspecification (Farrar & Glauber, 1967). As a result, it is the exchange rate and domestic GDP that capture the effects of the downturn in the Norwegian oil sector.

Equation (1) of hotel demand in log-log form is:

$$\ln Y_{it} = \alpha_0 + \alpha_1 \ln GDP_t + \alpha_2 \ln EX_t + \alpha_3 \ln HP_{it} \quad (2)$$

where α_i are parameters to be estimated, which can be interpreted as elasticities except α_0 that is a constant. Elasticity is a popular measurement in economics and is quantified as the percentage change in dependent variable as a response to one percentage change in an explanatory variable. For instance, α_1 is interpreted as the percentage change in hotel overnight stays by inbound tourists when their GDP (income) increases by 1%.

In the estimation process, we found that hotel price (HP) was strongly endogenous with the number of overnight stays, the dependent variable (Y_{it}). Since most of hotels adjust prices according to the numbers of bookings, this creates simultaneous dependence of hotel price on number of guest nights. To avoid the endogeneity issue, we shifted hotel price to the left side of the equation (multiplying it with demand Y_{it}). By doing this, instead of demand functions, revenue functions are estimated:

$$\ln R_{it} = \beta_0 + \beta_1 \ln GDP_t + \beta_2 \ln EX_t \quad (3)$$

where R_{it} represents the aggregated hotel revenue in region i generated by the hotel guests.

In the study, we want to investigate the effects of the fall in oil price on the Norwegian tourism industry through its effect on exchange rates and domestic GDP. The oil price has

made the NOK weaker and thus should affect positively tourism by attracting more inbound tourists' overnight stays. At same time, it may have boosted domestic leisure demand for hotels due to that weakening of the NOK makes travelling on holidays abroad more expensive. On the other hand, the oil price has reduced the economic activity in domestic oil industry. Although the oil industry is centered in the western parts of Norway, the oil related economy extends to the whole nation. The reduced activity in this key economic sector should have dampened business-related hotel demand in Norway. To investigate the effects of the Norwegian GDP and exchange rate on the total hotel demand in general and tourists' hotel demand in particular, two equations with the dependent variables of the corresponding revenues in the dimensions are estimated. To identify the influences of the reduced economic activities in the different regions, five interacts of the Norwegian GDP with regional dummies are included as independent variables to the model. The resulting empirical model specifications thus become:

$$\ln R_{it}^{total} = \delta_{i0} + \delta_{i1} \ln GDP_t^{nor} + \sum_{l=0}^5 \vartheta_{il} (\ln GDP_{it}^{nor} \times DR_l) + \pi_i \ln EX_t + \sum_{l=1}^5 \omega_{il} DR_l + \sum_{l=1}^5 \sum_{m=1}^3 \mu_{i,lm} DR_l Q_m \quad (4)$$

Equation 4 is the total revenue function for both the domestic and international hotel guests. GDP_N is the GDP for Norway. Since domestic hotel guests account for 73% of the total overnight stays in Norway, we use the Norwegian GDP in this specification. Furthermore, we assume the reduced economic activities resulting from the collapse of the oil price affect differently on the hotel demand in the different regions. Particularly, compared to the other regions, it has a larger negative impact in the oil industry clustered region (i.e., Western Norway). To identify this variation, we have interactions between regional dummies and

GDP_t^{nor} . Specifically, $\ln GDP_t^{nor} \times DR_L$ interacts of the Norwegian GDP with the regional dummies, where $L=1, 2, 3, 4, 5$ represent Eastern, Southern, Western, Central, Northern Norway, respectively. By doing this, the parameter of $\ln GDP_t^{nor}$ measures the effect of GDP on the base region, which is the capital Oslo, and the parameters of $\ln GDP_t^{nor} \times DR_L$ measure the difference of GDP effect in region L compared to Oslo. The GDP elasticity in region L is thus computed by the parameter of $\ln GDP_t^{nor}$ plus that of $\ln GDP_t^{nor} \times DR_L$.

EX_t is weighted real exchange rates of the currencies of the top 10 countries' currencies against NOK, computed by the nominal exchange rate times the share weighted CPI of these 10 countries divided by the CPI of Norway. Compared to the nominal exchange rate, the real exchange rate better reflexes the purchasing power of the foreign curries against NOK. The left variables DR_L and $DR_L Q_M$ are regional dummies and interacts of regional dummies with seasonal dummies.

We reestimate eq. 4 by separating out the tourist guests and the corresponding hotel revenue associated with their demand. The dependent variable in the tourist equation then becomes the hotel revenue given by the tourists' hotel overnight stays. The independent variables are identical as that in eq. 4. The tourists' overnight stays consist of a mix of domestic and international hotel guests. The exact shares of domestic and foreign guests are unknown within this sub-segment. But the growing numbers in both the total international overnight stays and the travel for holiday imply that the share of international hotel overnights in the tourist segment is higher than in business and course & conference segments. Nonetheless, domestic hotel guests still dominate, which makes the Norwegian *GDP* the preferred income measurement.

Estimated results

Equation 4 and its decomposed equation of tourism were estimated by multivariate ordinary least square (OLS) using the statistical software R. Table 1 shows the estimation results for the models. Most of the estimated parameters are significant and have the expected signs with R^2 s equal to 0.86 and 0.90. As expected, the results show that weaker NOK has contributed significantly to the tourist boom in Norway. The impact on hotel demand revenue of the reduction in domestic GDP following the downturn in the oil sector varies across the regions. Western Norway is the most affected, where the “oil capital” of Norway, Stavanger, is located. In next section, we discuss these results in more detail.

Insert Table 1 here

In the equation for the total overnight stays (Table 1), the estimated coefficient of GDP_t^{nor} is around 0.5 implying slower decline in hotel revenue relative to the Norwegian economic recession. Specifically, it suggests when the Norwegian GDP decreases by one percent, the total hotel revenue in the base region Oslo decreases by 0.5%. However, as GDP_t^{nor} fell 29% from 2013 to 2016, the impact is still considerable. As we have discussed, the five interaction variables between GDP_t^{nor} and regions modify the regional impact of GDP on hotel revenues relative to the base region. Among them, the interaction variable of Western Norway is positive and has the biggest magnitude (0.25). It means the elasticity of hotel revenue in Western Norway with respect to GDP_t^{nor} is 0.25 bigger than that of Oslo (base region). The elasticity for Western Norway then becomes 0.75. It suggests the impact of the economic downturn has been greater in Western Norway than any other regions. This finding provides support for hypothesis H1 that the bulk of these demand changes are oil-driven.

As expected, the impact of the exchange rate on the total hotel revenue is large (Table 1). The estimated elasticity of total hotel revenue with respect to the real exchange rate is around -1.1, which is in accordance with previous findings (Peng et al., 2014). The magnitude of the exchange rate elasticity is larger than any regional GDP_t^{nor} elasticity. For instance, it is more than the double of the magnitude of the GDP_t^{nor} elasticity in Oslo. This result explains why hotel revenue in Oslo has continued to increase during the oil slump. The reason is that the weakening of the local currency has more than compensated for the negative effects of domestic GDP. In sum, the weakening of NOK has increased the comparative price advantage of the Norway as a destination.

Table 1 also shows the decomposed effects of domestic GDP and exchange rate on tourist-generated hotel revenue. Compared to total hotel revenue equation, the GDP_t^{nor} elasticity in the tourism equation is slightly larger for Oslo and Northern Norway than for Western Norway, signaling that it was the business segment that made Western Norway the most sensitive region to GDP changes in the total revenue function. What most stands out about these regional differences are the inelasticity of hotel revenue in the Eastern and Southern Norway to income changes. What this probably reflects is that the income of tourists' who stay over in hotels in these two regions are is not influenced much by the oil sector.

The exchange rate elasticity is larger in the tourist equation than in the total revenue equation. This reflects that private households are more price sensitive than businesses in relation to travel decisions (Brons, Pels, Nijkamp, & Rietveld, 2002). In fact, when evaluated on its own, the tourist segment has been extremely responsive to the weakening of the Norwegian krone (with a magnitude of 1.6 elasticity). This has also brought more foreigners to Norway and likely made them stay longer in Norway (Alegre & Pou, 2006). These results

support to the idea that the downturn in one economic sector and the resulting improvement in price competitiveness can give birth to a tourist nation.

To give an overall evaluation of how the collapse of the oil price affects the Norwegian hotel demand. We use the estimated elasticities of GDP and exchange rate to compute the magnitude of their impacts on the Norwegian hotel industry. The GDP elasticity in each segment is the mean elasticity, which as discussed earlier, is the estimated elasticities of each region weighted by the average number of stayover nights in each category by region. Following this method, we get the weighted elasticity of GDP in the total revenue equation is 0.50. The Norwegian GDP declined by 29% between 2013 and 2016. This means the recession in the Norwegian economy made the total hotel revenue in Norway decreased by 15% (0.50 multiply 29%). At the same time, the elasticity of the exchange rate is -1.14. The NOK depreciated by 18% in the same period. It means the weak NOK made the total hotel revenue increased by 20% (1.14 multiply 20%). The net effect of these two is 4%. Therefore, the hypothesis H2a the overall effect of fall in the oil price on total hotel demand in Norway is positive is supported.

For the holiday segment, the weighted GDP elasticity is 0.56. Again, the rate of GDP decline is 29% in this period. Therefore, the revenue decrease in this segment given by the economic recession is 16%. The exchange rate elasticity in the holiday equation is -1.59, again the NOK depreciated by 18%. Therefore, the hotel revenue growth in tourism segment contributed by the deprecation in NOK is 29%, which is quite significant. The net effect of both GDP and NOK is 12%, much bigger than 4% in the same measurement for the total hotel revenue. The hypothesis H2b that the overall effect of the oil price fall is greater for tourists' hotel demand compared to total demand that also include the business and course & conference guest segments is therefore also supported.

One caveat is that elasticity measures the marginal effect of a factor. The average effect of the factor is always bigger than the marginal effect. Therefore, although the above evaluation makes sense, the actual growth rates for both the total hotel revenue and revenue created by the tourist segment are larger than those predicted here. In reality, they are 14% and 25%, respectively, for total and tourist hotel revenue.

Discussion

In the study, the impact of the oil price collapse on the Norwegian tourism industry has been investigated in two dimensions. First, the oil price reduction made the Norwegian economy slow down, in particular for the regions dominated by the oil industry. The oil-induced economic recession reduced hotel demand due to 1) oil and oil-service companies' sharp reduction in travel expenditures and 2) households' reduced incomes. Second, the oil price collapse weakened the Norwegian kroner, which made it cheaper for international visitors to travel to Norway and more expensive for Norwegian travelers to travel abroad. This jointly made more tourists spend more days in Norwegian hotels. The estimated results show that the weakening of the NOK has more than compensated from the negative GDP effect. Specifically, it has increased the price competitiveness of Norway and attracted more tourists.

Even if tourism development will depend on building appeal, image, quality of tourist services, destination marketing and promotion, cultural ties and etc. (Dwyer, Forsyth, & Rao, 2000), these findings show that price competitiveness is key. If tourists perceive a destination is dear relative to competing destinations they will largely shun it, besides that small segment willing to pay the high price to experience whatever is different or unique at that destination. In Norway, the fjords and Northern lights are among those unique

characteristics and it is interesting to note that the success of international cruise lines, which allows tourists to experience both, is likely because they shelter their passengers from the high price level in Norway (Larsen et al., 2013).

Before the oil crisis, even if Norway had all the desired characteristics to be competitive (Gooroochurn & Sugiyarto, 2005), travel cost and cost of other tourism services choked the development of the Norwegian tourism industry. This can be viewed as a crowding out effect since the oil industry employed inputs that otherwise the tourism industry could have used. In a literal sense, this was reflected by oil companies' demand for hotel rooms, pushing up room rates and thereby displacing tourists with lower purchasing power. However, it extended to key inputs such as labor since the higher productivity allowed oil companies to pay much higher salaries than ever attainable in the tourism industry. The wealth created by the oil industry was spread around creating inflationary effects for all services and products that could not be imported cheaply – leading to the price uncompetitiveness of Norway.

The oil price collapse and contraction of the oil sector resulting in a weaker NOK substantially improved Norway's relative price competitiveness. This type of cross sectorial effect of a large non-tourism industry on tourism competitiveness has been little discussed in the tourism literature.

In conjunction with the discussion of whether tourism growth cause economic growth (see e.g. (Lee & Chang, 2008), this case study is an example where tourism growth associates with economic regress. The tourism growth caused by the oil price collapse will never compensate for the oil revenue losses since - of all the major industries in Norway - tourism has the lowest productivity (Iversen, Løge, Jakobsen, & Sandvik, 2014). The extensive use of a migratory workforce in tourism reflects the low productivity and seasonal pattern of employment (Joppe, 2012; Lundberg, Gudmundson, & Andersson, 2009), while

domestic residents prefer to seek employment in industries with more permanent job situation and higher wages.

A more uplifting perspective, however, is the potential long-term effects of increased price competitiveness on tourism productivity; The largest confederation of Norwegian enterprises, NHO, reported in a survey from 2017 that covered 2000 of their member enterprises that of all industries tourism businesses had the highest willingness to invest and the strongest confidence in future market conditions (NHO, 2017). As anecdotal evidence, the authors recently noted a newspaper reporting of counties' investment plans in funiculars to create easier access to panoramic nature views for tourists. This comes across as a newfound focus for local politicians in regards to regional industry development. As Norway likely will remain a high-cost destination for many years to come, increased capital investments in tourism transport and infrastructure will contribute to productivity growth. This could create new employment opportunities for skilled labour in tourism that offer competitive wages compared to similar job opportunities in other industries.

Conclusion

In this paper, we have estimated hotel revenue functions at the regional level in Norway. The purpose was to investigate the effects of the oil price collapse on tourism demand. The oil industry is a dominant economic sector in Norway which high demand for economic resources has inflated the general price level nationally. A side effect is that the Norwegian tourism industry has struggled with poor price competitiveness.

We tested the hypothesis that the downfall in oil revenues caused by the fall in crude oil prices has boosted tourism growth through a weakening of the local currency, Norwegian kroner. The analysis supported this hypothesis since the currency effect far outweighed the

negative income effect caused by a downfall in oil revenues and the negative spillover effects at the economy at large.

This result suggests that a subset of rich countries where wealth inflate prices of tourism services can have problem in developing its tourism industry. Not all rich countries will have this challenge, because in cases where income and wealth in relative terms are highly unequally distributed across its population, tourism services are likely to remain price competitive. In these types of economies access to low-skilled low-wage workers will normally be plentiful.

This case study demonstrates the key role of price competitiveness for a destination. Moreover, it shows that tourism competitiveness is not strictly positively correlated with GDP, but actually could have an inverted-U relationship. Hence, tourism development is not always associated with economic growth as discussed in most of tourism literature. A policy implication of these findings is that the climate for tourism investment is likely to be poor if the industry perceives that price level is a key barrier for attracting tourists. This means that government policy to promote tourism will have modest impact unless it addresses the key limitation - price competitiveness.

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Table 1. Estimation results for the total, international and domestic overnight stays

	Total		Tourism	
	Estimate	<i>t</i> value	Estimate	<i>t</i> value
<i>Intercept</i>	14.507**	(11.775)	9.594**	(4.251)
<i>lnGDP_I / lnGDP_N</i>	0.511**	(4.802)	0.856**	(4.387)
<i>lnGDP_N * EN</i>	-0.238	(-1.584)	-0.797**	(-2.893)
<i>lnGDP_N * SN</i>	-0.212	(-1.406)	-0.642**	(-2.330)
<i>lnGDP_N * WN</i>	0.253*	(1.682)	0.032	(0.118)
<i>lnGDP_N * CN</i>	0.114	(0.758)	-0.101**	(-0.367)
<i>lnGDP_N * NN</i>	0.070	(0.468)	0.118	(0.429)
<i>lnEX_{IN}</i>	-1.136***	(-16.459)	-1.594**	(-12.613)
<i>EN</i>	2.490	(1.431)	8.912**	(2.796)
<i>SN</i>	1.973	(1.134)	7.053**	(2.212)
<i>WN</i>	-3.044*	(-1.749)	-0.761	(-0.239)
<i>CN</i>	-2.002	(-1.15)	0.229	(0.072)
<i>NN</i>	-1.762	(-1.012)	-2.544	(-0.798)
<i>ENQ₁</i>	0.334**	(6.499)	0.589**	(6.251)
<i>ENQ₂</i>	0.176**	(3.422)	0.424**	(4.499)
<i>ENQ₃</i>	0.454**	(8.841)	0.960**	(10.202)
<i>SNQ₁</i>	0.395**	(7.667)	0.656**	(6.959)
<i>SNQ₂</i>	0.230**	(4.474)	0.393**	(4.173)
<i>SNQ₃</i>	0.594**	(11.554)	0.969**	(10.297)
<i>WNQ₁</i>	-0.126**	(-2.441)	-0.169*	(-1.788)
<i>WNQ₂</i>	0.389**	(7.574)	0.813**	(8.633)
<i>WNQ₃</i>	0.653**	(12.713)	1.342**	(14.252)
<i>CNQ₁</i>	-0.054	(-1.041)	-0.028	(-0.301)
<i>CNQ₂</i>	0.201**	(3.903)	0.501**	(5.319)
<i>CNQ₃</i>	0.501**	(9.751)	1.102**	(11.707)
<i>NNQ₁</i>	0.057	(1.114)	0.060	(0.638)
<i>NNQ₂</i>	0.369**	(7.181)	0.762**	(8.098)
<i>NNQ₃</i>	0.605**	(11.78)	1.277**	(13.561)
Adjusted <i>R</i> ²	0.90		0.86	

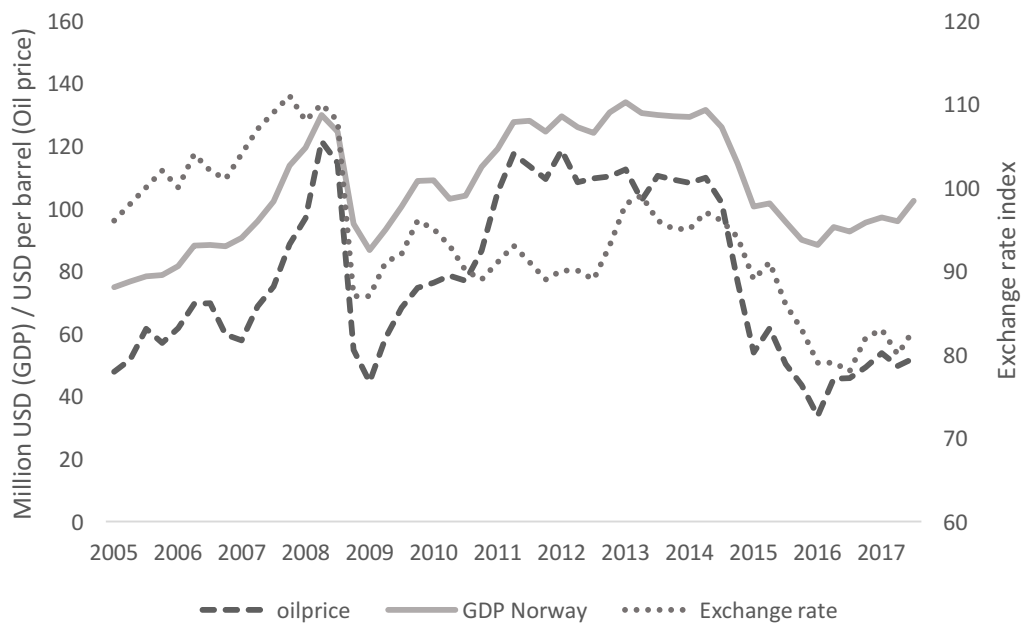


Figure 1. The correlation of oil price with the Norwegian GDP and the Norwegian Krone

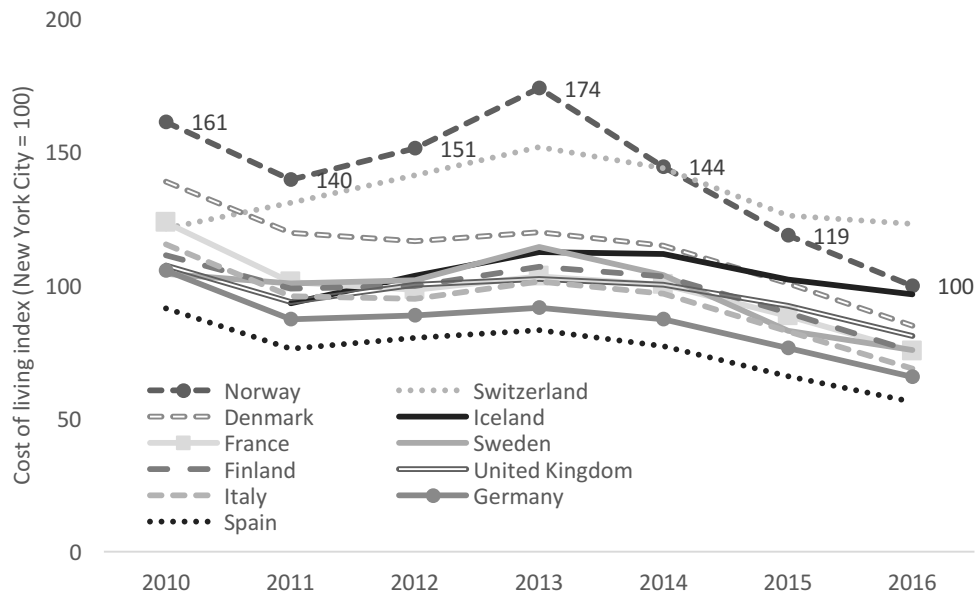


Figure 2. Cost of living index in Norway and other European countries (Numbeo.com, 2018)

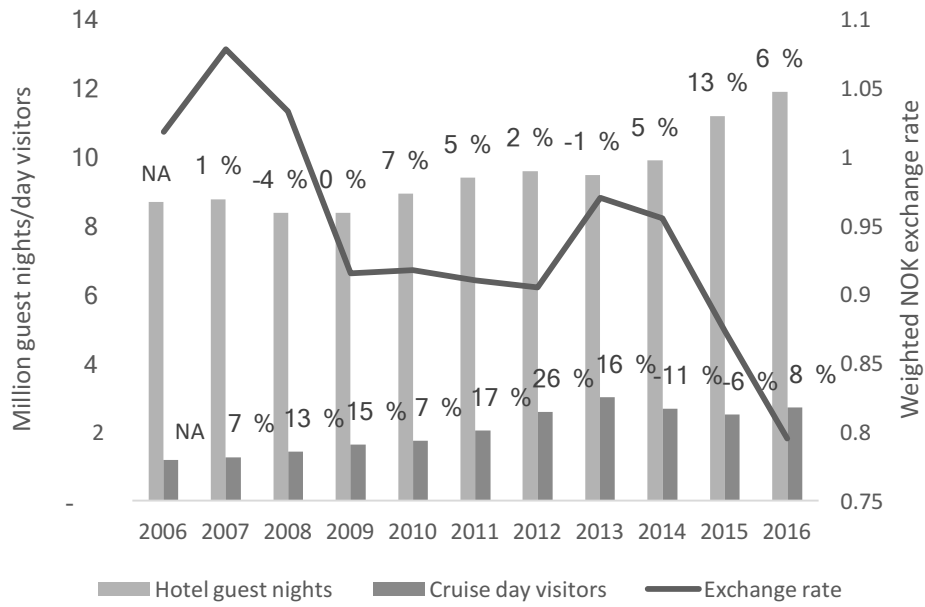


Figure 3. Development in number of tourists' hotel guest nights and cruise passengers' day visits relative to changes in value of NOK currency.