

## **Determinants of Local Destination Air Ticket Demand: A Lesson from Norwegian Airlines Operating on the Link Between Molde and Oslo**

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### **Abstract**

*The study aimed at examining the influence of air ticket full price, air ticket happy price, car price, presence of express bus, train price, population, and seasonality on air ticket demand. Based on secondary data for air traffic on the link between Molde and Oslo, from January 2013 to December 2019 and using multiple linear regression analysis, we find that air ticket happy price, train price, population, and seasonality all significantly predict local destination air ticket demand. The findings are useful in explaining the determinants of local destination air ticket demand. Thus, understanding the determinants of local destination air ticket demand, namely, air ticket price, train price, population, and seasonality, is essential in determining local destination air ticket demand to enhance managerial planning. Moreover, this study provides building blocks for the applicability of demand theory in the airline industry.*

**Keywords:** Air Ticket Happy Price; Train Price; Population; Seasonality

**JEL:** L93 P22 P23 R41

### **1. Introduction**

The airline industry is among the most attractive industries in the world, with its origins traced back to the beginning of the 20th century (Gourdin, 2016). According to Baikgaki (2014), airline transport is the fastest means of movement and facilitates economic prosperity in terms of growth and development for regions, cities, towns, countries, and the world at large. The presence of air transport advocates both domestic and international trade as well as tourism in various countries (Marazzo et al., 2010; Thornleyva et al., 2015). Understanding factors that determine air ticket demand is essential for planning and scheduling flights based on carriage capacity. Further, the understanding enhances the airport authorities to decide whether to expand airport facilities or not. Appropriate projection of future air ticket demand is possible with proper specification of factors determining air ticket demand. With appropriate future projections of air ticket demand, authorities can

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develop facilities that can accommodate passengers at airports while ensuring good service to them. Therefore, analyzing air ticket demand in particular destinations assists in planning for future infrastructure required at particular airports (Priyadarshana & Shamini, 2015). Previous studies on the airline industry focused on exploring general uncontrollable factors that influence the operation of airlines and air ticket demand, such as economic conditions (passengers' purchasing power, growth of domestic product, and fuel costs), demographics, terrorism, and regulations (Gourdin, 2016; Tolcha et al., 2020). Based on reviewed literature, the general factors that affect air ticket demand are to a great extent observed in terms of economic, social-cultural, technological, ecological, and global.

Economic factors that influence air ticket demand include issues like gross domestic product, airfares, total expenditure, income, jet fuel price, purchasing power parities, exchange rates, net direct investment, and the presence of tourism enterprises (Abdella et al., 2021; Ba-Fail et al., 2000; Baikgaki & Daw, 2021; Chèze et al., 2011; Chi & Baek, 2012a; Dayioglu & Alnipak, 2023; Hofer et al., 2018; Kağan et al., 2020; Valdes, 2015; Vicente & Reis, 2022). Social-cultural factors include issues like population, distance to the nearest airports, accessibility of the airport, market concentration, presence of academic institutions, and domestic migration (Ba-Fail et al., 2000; Baikgaki & Daw, 2021; Chi & Baek, 2012a; Dayioglu & Alnipak, 2023; Hofer et al., 2018; Iyer & Thomas, 2021; Kağan et al., 2020; Vicente & Reis, 2022). Technological factors include issues like structural changes (e.g., low-cost carriers), increases in high-speed railway routes, the presence of commercial aircraft fleets, catchment areas, and surface transport options (Dayioglu & Alnipak, 2023; Kağan et al., 2020; Strauss et al., 2021; Valdes, 2015). Ecological factors include issues like seasonality (time) and the destination attraction (Abdella et al., 2021; Vicente & Reis, 2022). Global factors include issues like international migration and public policies such as an open skies agreement (Kağan et al., 2020; Valdes, 2015).

The extent to which general factors influence local air ticket demand in specific countries is limited (Gourdin, 2016; Tolcha et al., 2020). In the current situation, where there is an increase in the demand for people to move from one place to another within the country, it is imperative for studies to focus on factors that determine air ticket demand between local destinations.

According to Baikgaki (2014), it is projected that air ticket demand will rise by 15.1 percent. This enhances call-for-action for regions, cities, towns, countries, and the world at large to accommodate the increasing number of air passengers. As a result, it is essential to identify factors influencing air ticket demand within a particular country by focusing on routes between

regions, cities, and town airports. Countries that have well-developed networks of airports that allow smooth movements of people to flexibly perform their activities are said to be fastest-growing in terms of economic growth. Notably, it is important to understand factors that facilitate people travelling by flight in countries with well-established airport networks (Njoya & Nikitas, 2020).

The projected rise of airline passengers calls forth airport authorities all over the world to plan for required revamping of airport infrastructure and designing structures that enhances the full functioning of airport terminals (Baikgaki, 2014; Dayioglu & Alnipak, 2023; Priyadarshana & Shamini, 2015). Normally, developed models assist in planning and designing airports for proper functioning. Some countries, such as Norway, have sought to revamp airport infrastructure and design structures that enhance the full functioning of airport facilities such as runways and passengers' arrival and departure facilities (IMF, 2018). According to Mhlanga (2017), it can be argued that the proper functioning of developed airport infrastructure is evaluated by establishing air ticket demand models that are suitable for the respective regions, cities, and towns in a particular country. More importantly, most of the previous studies on air ticket demand focused on countries like the USA, UK, and Australia and great corridors for business like the Organisation for Economic Co-operation and Development (OECD) and the Southern African Development Community (SADC). Conversely, studies on air ticket demand in other countries, including Norway, are cited as limited (Priyadarshana & Shamini, 2015).

The aim of this research is to add details and significance to the essential facts about the model evaluation of factors influencing air ticket demand while focusing on the link between Oslo and Molde in Norway. It is anticipated that Norway's flying market will expand by 0.96% between 2023 and 2027, reaching a market size of €1.86 billion by t2023 (SMI, 2023). This research is crucial since there is limited research on factors determining air ticket demand in Norway. According to Norway's airline policy as presented on the Oslo airport website, passengers using specific airlines can arrive from overseas and continue their journey domestically without having to pick up their bags when using a domestic transfer. Reminding them to inquire about what pertains to their trip with their airline is important. Only passengers with valid tickets are eligible to use the domestic transfer solution. Depending on the airline and where they are arriving from, there are varied policies regarding transfers for international travellers continuing on domestic flights. Travellers must have reserved a ticket with an onward connection with one of the following airlines: SAS, Norwegian, Widerøe, or Emirates in

order to use domestic transfers. Domestic transfers are available every day from 7:00 to 23:00. When arriving in Norway on an airline other than SAS, Norwegian, Widerøe, or Emirates and planning a domestic flight, passengers must proceed to the arrival hall, retrieve and hand over any luggage, then go through security checks in the departure hall before continuing on with their journey. This also holds true for passengers who simply travel with handbags.

Therefore, this research focuses on answering the following questions: What are the factors that influence air ticket demand? What are the relationships between the identified factors and air ticket demand? What is a suitable model for explaining the relationship between these factors and air ticket demand? Generally, it can be argued that for the necessity of developing an appropriate air ticket demand model, both quantity and quality of variables should be considered. The general objective of this study is to determine factors influencing air ticket demand on the link between Oslo and Molde in Norway. Specifically, the study focuses on analyzing the influence of air ticket price (full price and happy price), substitute price (train price and car price), availability of express buses, population, and seasonality on air ticket demand.

## **2. Theoretical Literature Review**

The theory of demand guided this study in establishing the associations that exist between key determinants and air ticket demand. According to Baikgaki (2014), air ticket demand is the willingness and ability of a passenger to purchase air ticket demand in the market at a given price in a particular period. In the air ticket market, the demand side comprises passengers of air transport. Thus, it deals with the purchase of air tickets and focuses on the behaviour of passengers in the air ticket market. The quantity of air tickets demanded is the number of air tickets that passengers are willing and able to buy during a specific period at a given price. It is measured in terms of air ticket amounts within a given period, for example, daily, monthly, quarterly, semi-annually, and annually. Accessibility and connection with other transportation auxiliaries are essential in making a decision on purchasing air tickets. Therefore, it is important to know the determinants of air ticket demand; i.e., those encouraging and those discouraging (Abed et al., 2001). Since previous studies, such as the one conducted by Ba-Fail et al. (2000), highlighted that general factors such as demographic and economic factors influence air ticket demand, this study will specifically base it on factors under demand theory such as the price of air tickets, substitute transports, seasonality, and population.

The theory of demand normally operates under the law of demand, which assumes an inverse relationship between the price of a good or service and

the amount demanded. Under this law, it is expected that there is an inverse (negative) relationship between the price of an air ticket and the amount that passengers are willing and able to purchase, with other factors remaining constant. Therefore, the law of demand states that, other things remaining constant, when the price of a good or service, such as an air ticket, rises, its amount demanded will decrease, whereas when the price of a good or service falls, its amount demanded will increase. That is, if a passenger usually buys two air tickets each at a price of Tshs 500 and the price per ticket increases to Tshs 700, assuming other factors remain constant, Hence, according to Nicholson & Snyder (2017), the law of demand operates under the following assumptions:

*There is no change in consumers' income:* The law of demand operates only when consumers' incomes do not change. That is, the consumer's purchasing power must remain constant. The law will not operate if the consumers' income changes. For example, if an employee's salary increases and the price of goods and services increases, the employee will not hesitate to buy goods and services at higher prices because the salary has increased.

*There should be no change of taste and preferences of the consumer:* If the taste and preference of consumers change, demand for goods and services will change regardless of an increase or decrease in price. For example, if a teenager stops wearing sneakers and starts preferring sandals, even if the price of sneakers falls, the teenager will not purchase them because the preference has changed.

*Prices of all other related goods should not vary:* If the price of other related goods changes, the law of demand will not hold. For example, if juice and soda are substitute products, where the price of juice is Tshs 600 per bottle and the price of soda is Tshs 500 per bottle, then consumers demanded more soda than juice. But when the price of juice falls to Tshs 350 per bottle, consumers will reduce demand for soda and increase demand for juice due to the fall in the price of juice. Thus, the quantity demanded for soda will fall due to the change in the price of related goods, even though its price is constant.

*Consumers do not expect future changes in price:* This is because if consumers expect a rise in the price of goods in the future, they might increase demand for particular products, regardless of the current increase in the price of those goods. And if consumers expect a fall in the price of goods in the future, they might decrease demand for goods, even if there is a current decrease in price.

### **3. Empirical Literature Review**

#### **3.1 Air Ticket Full Price and Air Ticket Demand**

Generally, previous research has shown that different factors determine the demand for a good or service without specifically mentioning which good or service, such as air ticket demand. However, some goods and services violate the theory of demand. The hypotheses for this study are formulated specifically for air ticket demand to see if there is any violation or adherence to the theory of demand. The law of demand states that, other things remaining constant, when the price of a good or service, such as an air ticket, rises, its amount demanded will decrease, whereas when the price of a good or service falls, its amount demanded will increase (Nicholson & Snyder, 2017). Baikgaki and Daw (2021) found that air ticket prices influence air ticket demand. However, in some cases, when prices go up, people continue spending, and when prices fall, people do not spend more (Rojas & Peterson, 2008). Such contradictory results have necessitated searching for further evidence on this assumption by focusing on air ticket demand, and thus, hypothesis one is formulated as follows:

*H1: There is a negative association between air ticket full price and air ticket demand.*

#### **3.2 Air Ticket Happy (Promotional) Price and Air Ticket Demand**

Sometimes firms can decide to compete through price by lowering the price to attract or poach customers from competitors (Hong-Yan et al., 2010). From this argument, air ticket demand is expected to increase once there is a happy price, which is regarded as a promotional price. However, empirical research such as that conducted by Marand et al. (2021) shows that passengers are willing to purchase air tickets at higher prices provided there is assurance of the fastest and most reliable services. On the other hand, a study by Abdella et al. (2021) supports that lowering the price of air tickets increases air ticket demand. Such contradictory results on happy (promotional) price necessitated finding more evidence to support the influence of happy (promotional) price on a good or service, and thus hypothesis two is formulated as follows:

*H2: There is a negative association between air ticket happy price and air ticket demand.*

#### **3.3 Train Price and Air Ticket Demand**

Changes in technology tend to influence the demand for goods or services (Varian, 2014). Previously, there was no stiff competition between airlines and trains. With the rise of technology and advancements in high-speed

railways, there is competition between airlines and trains (Yang et al., 2018). According to Takebayashi (2018), the presence of high-speed railways increases the number of passengers who purchase air tickets when hubs are created. However, the study by Strauss et al. (2021) suggests that the presence of high-speed railways decreases the number of passengers who use airlines in a domestic country. Thus, from such contradictory findings and since they did not base them on high-speed train prices, it is valuable to increase empirical research to find out if train fares positively influence air ticket demand. Thus, hypothesis three is formulated as follows:

*H3: There is a positive association between train price and air ticket demand.*

### **3.4 Car Price, Availability of Express Bus and Air Ticket Demand**

Economic theory suggests that people are more price-sensitive when there are substitute goods or services (Coulibaly et al., 2014). Empirical studies suggest that passengers can rarely switch from air ticket demand to other forms of transport, such as trains, private cars, and express buses (Escobar, 2017). In light of such contradictions, this paper is tailored to search for further evidence to determine if the price and availability of substitute means of transport have a positive influence on air ticket demand. Therefore, hypotheses four and five are formulated as follows:

*H4: There is a positive association between car price and air ticket demand.*

*H5: There is a negative association between availability of express bus and air ticket demand.*

### **3.5 Population and Air Ticket Demand**

According to Desmet and Parente (2010), the size of the population influences the demand for goods and services in a particular area. The population in a particular country, region, district, or any other classified geographical area determines the demand for goods and services. Furthermore, a study in China revealed a positive association between population size and the potential demand for goods and services (Li et al., 2010). Other studies conducted in different empirical settings also portrayed a positive association between population and air ticket demand (Ba-Fail et al., 2000; Baikgaki & Daw, 2021; Chi & Baek, 2012a; Dayioglu & Alnipak, 2023; Kağan et al., 2020; Vicente & Reis, 2022). However, the influence of population size on demand for goods and services differs across countries and depends on whether the country is developed or not (Hassan & Salim, 2011). Thus, it is imperative to understand

if population size has a positive influence on air ticket demand, and hence hypothesis six is formulated as follows:

*H6: There is a positive association between population and air ticket demand.*

### **3.6 Seasonality and Air Ticket Demand**

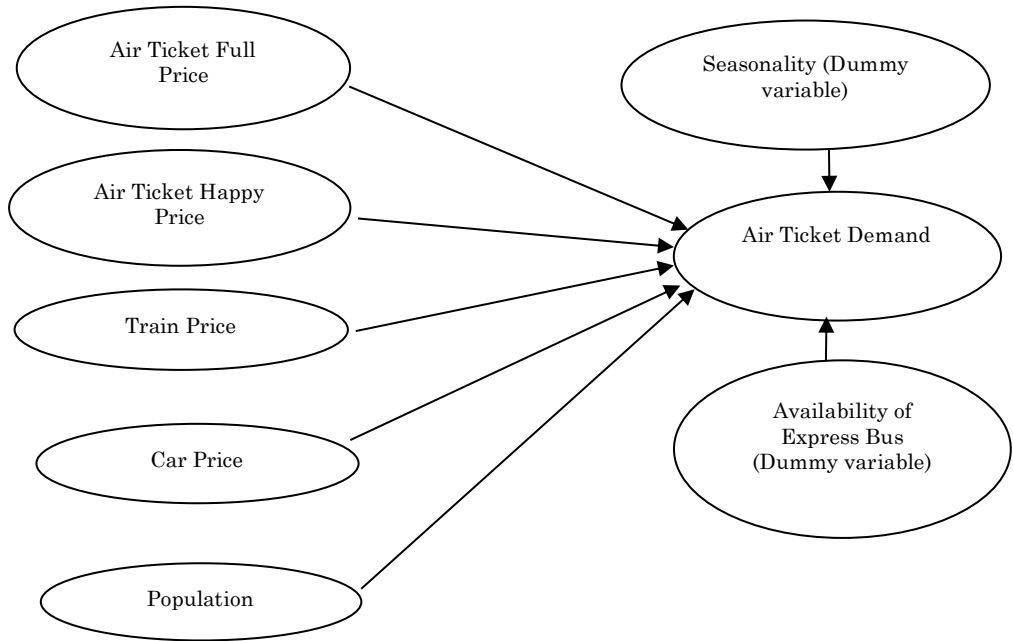
Several pieces of literature, such as Duro (2016), Coshall et al. (2015), Rosselló and Sansó (2017), and Vatsa (2021), recognize the influence of seasonality on goods or service demand. Borrowing from Rosselló and Sansó (2017), demand for goods and services varies weekly, monthly, and yearly. Understanding seasonal variation helps in planning appropriate vessels to use on a particular route (Chi & Baek, 2012b; Coshall et al., 2015). The study conducted by Abdella et al. (2021) found that seasonality (time) has an influence on air ticket demand without specifying exactly which months have high or low air ticket demand. Moreover, the effect of seasonality differs across goods, services, and sectors or industries. Therefore, it is valuable to find out if there is seasonal variation in air ticket demand across months. Hence, hypothesis seven, with its subs, is formulated as follows:

*H7: There is a seasonal variation in air ticket demand such that: (a) air ticket demand in February is more than air ticket demand in January; (b) air ticket demand in March is more than air ticket demand in January; (c) air ticket demand in April is more than air ticket demand in January; (d) air ticket demand in May is more than air ticket demand in January; (e) air ticket demand in June is more than air ticket demand in January; (f) air ticket demand in July is more than air ticket demand in January; (g) air ticket demand in August is more than air ticket demand in January; (h) air ticket demand in September is more than air ticket demand in January; (i) air ticket demand in October is more than air ticket demand in January; (j) air ticket demand in November is more than air ticket demand in January; and (k) air ticket demand in December is more than air ticket demand in January.*

### **3.6 Conceptual Framework**

The conceptual framework of this study is made up of seven (7) independent variables and one dependent variable. The independent variables are air ticket full price, air ticket happy price, train price, car price, population, availability of express buses, and seasonality. On the other hand, the dependent variable of this conceptual framework is air ticket demand.





**Figure 4:** Conceptual Framework  
Source: Synthesized from Literature

## 4.0 Methodology

### 4.1 Research Design

According to Yin (2009), a study design relies on aspects like the problem of the study, the study type, the empirical setting, and the objective of the study. This study employed a longitudinal design and focused on finding key determinants of air ticket demand on the link between Oslo and Molde in Norway. As opposed to cross-sectional studies, longitudinal studies allow repetitive collection of data on the same objects to capture causal effects; hence, they need enough budget and time. Conversely, cross-sectional studies allow the collection of data on the objects only once, thus requiring fewer resources and time. On the other hand, this study employed a descriptive research design as it aligned with the development of research questions and hypotheses prior to data collection.

The chosen empirical setting is essential due to several facts, such as: firstly, understanding factors that determine air ticket demand is important to the air industry. Secondly, the easy availability of reliable online data through websites. Thirdly, developing appropriate strategies, for example, Coshall et al. (2015) commended understanding air ticket demand variation as helping

management to come up with appropriate strategies that accommodate demand variation for each month by providing appropriate aircrafts. Moreover, the significant lesson of air ticket demand determinants will be shared and recognized by other countries.

#### **4.2 Data Collection and Empirical Model**

Secondary data can be obtained from different key sources, depending on the study problem and data availability. The secondary data for this research was extracted from online reports by using the websites of the Civil Aviation Authority (AAV) of Norway, Norwegian Airlines, and the International Air Transport Association (IATA). The data was extracted for each month from 2013 to 2019, summing up to 84 months (cases) for the seven years, as these are the only data that were extracted from online reports. The reports served as a valuable source of information for data collection because they are publicly available, allow for ongoing public examination, and require official board approval before being released (Ntim et al., 2017). The study employed data on a link between Oslo and Molde, as it was a link with adequate data for analysis. This implies that the first thing to consider when doing research is identifying where you can find data.

The extracted data involved the following information: Month: 1 for January, 2 for February, and so on; total demand: the total number of sold tickets. This is the variable we want to explain. Full price: the average price of an ordinary one-way ticket; happy price: the average price of a special low-priced ticket with limited refund ability and other restrictions; train price: the price of the competing train service; car price: the estimated average cost of using a private car for the trip; express bus: a dummy variable indicating whether the competing express bus was operating (1) or not (0); and population: the total population in Molde (measured only on a yearly basis. The data extracted for population were kept constant for a year, so the author had nothing to do with the conversion of the annual population into months but maintained the population in each year, and as for other variables (air ticket demand, full price, happy price, car price, and train price), a logarithmic transformation was applied. Therefore, based on the information above, the number of cases dealt with in this study was 84.

The multiple linear regression analysis methods that can be employed for this study are maximum likelihood (ML) and ordinary least squares (OLS). According to Gujarati (2004) and Hair et al. (2016), the OLS method is the most recommended and known approach for establishing the causal relationship as it provides imperative statistical features for analysis. This

study is based on OLS for estimating the coefficients of the employed variables, as described in the model below:

$$\begin{aligned} \text{Log}(Total_{Demand}) = & \beta_0 + \beta_1 \text{Log}(Full_{Price}) + \beta_2 \text{Log}(Happy_{Price}) + \\ & \beta_3 \text{Log}(Train_{Price}) + \beta_4 \text{Log}(Car_{Price}) + \beta_5 \text{Express}_{Bus} + \beta_6 \text{Log}(Population) + \\ & \beta_7 M_2 + \beta_8 M_3 + \beta_9 M_4 + \beta_{10} M_5 + \beta_{11} M_6 + \beta_{12} M_7 + \beta_{13} M_8 + \beta_{14} M_9 + \\ & \beta_{15} M_{10} + \beta_{16} M_{11} + \beta_{17} M_{12} + \varepsilon \end{aligned} \quad (1)$$

## 5. Findings of the Study

Descriptive statistics such as mean and standard deviation were performed for the collected data. After descriptive analysis, the data collected were further assessed to see if they aligned with various assumptions for multiple regression analysis. Assumption tests of normality, multicollinearity, misspecification, and heteroscedasticity, just to mention a few, are essential to be carried out before the estimation of coefficients when multiple regression analysis is employed. Based on the test conducted as presented in this study, it was found that the assumptions of multicollinearity (see the correlation matrix), misspecification, and heteroscedasticity were adhered to and warranted estimation of coefficients.

### 5.1 Multicollinearity Test

**Table 5: Correlation Matrix with Descriptive Statistics**

	Total_Demand (Tickets)	Happy_Price (NOK)	Train_Price (NOK)	Population (People)	Full_Price (NOK)	Car_Price (NOK)
Total_Demand (Tickets)	1.00	-0.10	0.23	0.27	0.16	-0.13
Happy_Price (NOK)		1.00	-0.55	0.72	0.78	-0.46
Train_Price (NOK)			1.00	-0.56	-0.82	-0.02
Population (People)				1.00	0.83	-0.52
Full_Price (NOK)					1.00	-0.18
Car_Price (NOK)						1.00
Mean	11322.96	771.29	605.92	23407.14	1212.04	1320.85
Std. Dev.	1501.67	75.61	13.57	291.86	124.56	20.34

**Source:** Extracted from online reports of Civil Aviation Authority (AAV)-Norway, Norwegian Airlines and International Air Transport Association (IATA).

**5.2 Heteroscedasticity Test**

The hypotheses for the heteroscedasticity test are given as:

$H_0$ : There is no heteroscedasticity Vs.  $H_1$ : There is heteroscedasticity of some unknown form. After performing the White test in Eview 10, the following estimates were obtained as extracted from the output.

**Table 2: Heteroscedasticity Test: White**

F-statistic	1.097	Prob. F(17,66)	0.375
Obs*R-squared	18.512	Prob. Chi-Square(17)	0.357
Scaled explained SS	11.949	Prob. Chi-Square(17)	0.803

From the Chi-square Distribution table, the critical value ( $X^2_{Critical} = X^2_{17, 0.05} = 27.59$ ) and the Chi square statistics as generated from Eviews output is  $X^2_{Statistics} = n.R^2 = 18.512$ . Since the  $X^2_{Critical} = X^2_{17, 0.05} = 27.59 > X^2_{Statistics} = n.R^2 = 18.512$ , then we do not reject  $H_0$  at 5% significance level and conclude that there is no statistical evidence ( $X^2_{Critical} = X^2_{17, 0.05} = 27.59 > X^2_{Statistics} = n.R^2 = 18.512$ , p-value = 0.357) that there is heteroscedasticity at 5% significance level.

**5.3 Misspecification Test**

The hypotheses for the misspecification test are given as:

$H_0$ : There is no misspecification vs.  $H_1$ : There is misspecification.

After performing a RESET test in Eview10, the following estimates were obtained as extracted from Eview output. Since the p-value is 0.193, which is greater than 0.05, we fail to reject  $H_0$  at 5% significance level and conclude that there is no statistical evidence (p-value = 0.193) at 5% significance level that there is misspecification in the functional form of our specified research model.

**Table 3: Ramsey RESET Test**

Omitted Variables: Squares of Fitted Values

	Value	Df	Probability
t-statistic	1.315	65	0.193
F-statistic	1.730	(1, 65)	0.193
Likelihood ratio	2.206	1	0.137

### 5.4 Regression Results

With the help of Eviews version 10 software, this study used multiple linear regression analysis to estimate the coefficients of established regression model as proposed by Wooldridge (2016). This type of analysis was chosen by Baikgaki (2014) and Ba-Fail et al. (2000), just to cite a few. After running the estimation and by extracting coefficients from Table 4, the equation below was established:

$$\begin{aligned} \text{Log}(\text{Total}_{\text{demand}}) = & -60.75 - 0.27\text{Log}(\text{Full}_{\text{price}}) - 0.99\text{Log}(\text{Happy}_{\text{price}}) + \\ & 1.69\text{Log}(\text{Train}_{\text{price}}) + 0.03\text{Log}(\text{Car}_{\text{price}}) - 0.02\text{Express}_{\text{BUS}} + \\ & 8.85\text{Log}(\text{Population}) - 0.04M2 + 0.05M3 + 0.18M4 + 0.21M5 + \\ & 0.19M6 + 0.25M7 + 0.28M8 + 0.24M9 + 0.17M10 + 0.17M11 - \\ & 0.01M12 + \varepsilon \end{aligned} \quad (2)$$

#### 5.4.1 Results of Goodness of Fit Statistics

The findings of the goodness of fit statistics on determinants of air ticket demand are presented in Table 4. The finding of R<sup>2</sup> square of multiple regression coefficients is 0.91 (91%). This finding implies that 91% of the variation in the dependent variable is explained by independent variables used in the regression model, whereas 9% of the variation is explained by other factors that are excluded in the model. Thus, it can be argued that the independent variables of the study are good forecasters. In the same vein, the ANOVA test indicates a significance value of 0.00 (p < 0.01). Therefore, it can be argued that the multiple linear regression model employed is statistically significant in determining air ticket demand.

#### 5.4.2 Findings

From Table 4, hypothesis one (H1), which stated that there is a negative association between air ticket full price and air ticket demand is not statistically supported ( $\beta_1 = -0.27$ ,  $t = -0.83$ ,  $p > .1$ ). Hypothesis two (H2), which stated that there is a negative association between air ticket happy price and air ticket demand is strongly supported ( $\beta_2 = -0.99$ ,  $t = -9.51$ ,  $p < .01$ ). Similarly, hypothesis three (H3), which stated that there is a positive association between train price and air ticket demand is strongly supported ( $\beta_3 = 1.69$ ,  $t = 3.50$ ,  $p < .01$ ). On the other hand, hypothesis four (H4), which stated that there is a positive association between car price and air ticket demand is not statistically supported ( $\beta_4 = 0.03$ ,  $t = 0.05$ ,  $p > .1$ ). In the same vein, hypothesis five (H5), which stated that there is a negative association between availability of express bus and air ticket demand is not statistically supported ( $\beta_5 = -0.02$ ,  $t = -0.49$ ,  $p > .1$ ).

Again, from Table 4 hypothesis six (H6), which stated that there is a positive association between population and air ticket demand is significantly supported ( $\beta_6 = 8.85$ ,  $t = 5.77$ ,  $p < .01$ ). Moreover, hypothesis seven (H7), which stated that there is a seasonal variation in air ticket demand such that: (a) air ticket demand in February is more than air ticket demand in January is not statistically supported ( $\beta_7 = -0.04$ ,  $t = -1.53$ ,  $p > 0.1$ ); (b) air ticket demand in March is more than air ticket demand in January is statistically supported ( $\beta_8 = 0.05$ ,  $t = 1.98$ ,  $p \leq 0.05$ ); (c) air ticket demand in April is more than air ticket demand in January is strongly supported ( $\beta_9 = 0.18$ ,  $t = 7.06$ ,  $p < .01$ ); (d) air ticket demand in May is more than air ticket demand in January is strongly supported ( $\beta_{10} = 0.21$ ,  $t = 8.31$ ,  $p < .01$ ); (e) air ticket demand in June is more than air ticket demand in January is strongly supported ( $\beta_{11} = 0.19$ ,  $t = 7.12$ ,  $p < .01$ ); (f) air ticket demand in July is more than air ticket demand in January is strongly supported ( $\beta_{12} = 0.25$ ,  $t = 9.73$ ,  $p < .01$ ); (g) air ticket demand in August is more than air ticket demand in January is strongly supported ( $\beta_{13} = 0.28$ ,  $t = 11.21$ ,  $p < .01$ ); (h) air ticket demand in September is more than air ticket demand in January is strongly supported ( $\beta_{14} = 0.24$ ,  $t = 8.83$ ,  $p < .01$ ); (i) air ticket demand in October is more than air ticket demand in January is strongly supported ( $\beta_{15} = 0.17$ ,  $t = 5.93$ ,  $p < .01$ ); (j) air ticket demand in November is more than air ticket demand in January is strongly supported ( $\beta_{16} = 0.17$ ,  $t = 5.80$ ,  $p < .01$ ); and (k) air ticket demand in December is more than air ticket demand in January is not statistically supported ( $\beta_{17} = -0.01$ ,  $t = -0.26$ ,  $p > 0.1$ ).

**Table 4: Estimated Research Equation Model**

Variable	Coefficient	Std. Error	t-Statistic
C	-60.75***	18.18	-3.34
LOG(FULL_PRICE)	-0.27	0.32	-0.83
LOG(HAPPY_PRICE)	-0.99***	0.10	-9.51
LOG(TRAIN_PRICE)	1.69***	0.48	3.50
LOG(CAR_PRICE)	0.03	0.71	0.05
EXPRESS_BUS	-0.02	0.03	-0.49
LOG(POPULATION)	8.85***	1.53	5.77
M2	-0.04	0.02	-1.53
M3	0.05**	0.02	1.98
M4	0.18***	0.02	7.06
M5	0.21***	0.03	8.31
M6	0.19***	0.03	7.12

	M7	0.25***	0.03	9.73
	M8	0.28***	0.03	11.21
	M9	0.24***	0.03	8.83
	M10	0.17***	0.03	5.93
	M11	0.17***	0.03	5.80
	M12	-0.01	0.03	-0.26
Air Ticket Demand	R-squared	0.91	Mean dependent var	9.33
	Adjusted R-squared	0.89	S.D. dependent var	0.14
	S.E. of regression	0.04	Akaike info criterion	-3.23
	Sum squared resid.	0.12	Schwarz criterion	-2.71
			Hannan-Quinn criterion	-3.02
	Log likelihood	153.50	Durbin-Watson stat.	2.07
	F-statistic	42.35		
	Prob(F-statistic)	0.00		

Note: \*\*\*p < 0.01, \*\*p ≤ 0.5, \*p ≤ 0.1 (two-tailed)

## 6. Discussion of Findings

This study focused on finding key determinants of air ticket demand on the link between Oslo and Molde in Norway. Some findings of this study reveal the existence of key determinants of air ticket demand. It can be noted that air ticket price, train price, and population of a particular destination have a significant association with air ticket demand. Also, seasonal variation in air ticket demand has been proven from March to November. However, full price air ticket, car price, and the existence of express buses have shown an insignificant association with air ticket demand. Similarly, the study failed to establish if there is any seasonal variation in air ticket demand in February and December when compared to air ticket demand in January. In line with Hong-Yan et al. (2010), it can be noted that a happy (promotional) price is one of the key determinants of air-tuned demand. This finding aligns with firms that compete in the oligopoly market where airlines operate (Waldman & Jensen, 2016). Among the features of the oligopoly market in which airlines operate is competition based on setting prices, and the airline that sets the lowest price captures many passengers (Waldman & Jensen, 2016). Thus, this study builds on blocks of the oligopoly market to justify that air-tuned demand relies greatly on the existence of a lower price that is considered a happy (promotional) price.

Similarly, this study aligns with Yang et al. (2018), who claimed that the presence of high-speed railways poses stiff competition for air-tuned demand. Other studies, such as the one conducted by Takebayashi (2018), suggest that the existence of high-speed railway supports calls forth a higher demand for air tickets if they act like hubs. This would have been appropriate if the two were used as complementary means of transport. From this study, it appears that airlines and trains on the link between Oslo and Molde in Norway are just competing means of transport. Therefore, this study treats air transport and trains as substitute means of transport. Likewise, air traffic demand depends on the availability of passengers at the destination. This study agrees with Desmet and Parente (2010) that the size of the population influences the demand for goods and services in a particular area. Additionally, it is consistent with Li et al. (2010), who argued that there is a positive association between population size and the potential demand for goods and services. Hence, this study acknowledges that population has a significant positive role in determining air ticket demand on the link between Oslo and Molde in Norway.

On the other hand, this study highlighted the influence of seasonality on air ticket demand. This finding is consistent with several pieces of literature, such as Duro (2016), Coshall et al. (2015), Rosselló and Sansó (2017), and Vatsa (2021), that recognise the influence of seasonality on goods or service demand. Moreover, this study aligns with Rosselló and Sansó (2017), who proposed that demand for goods and services varies weekly, monthly, and yearly. Thus, in accordance with Chi and Baek (2012 and Coshall et al. (2015), this study appreciates the role of seasonality in determining air ticket demand in different months of the year.

## **7. The Implications of the Study**

The study adds theory, management, and policy implications to the existing studies. Firstly, the guiding model indicated some essential issues in the setting of the developed country of Norway. Secondly, it adds to the literature on the connection between demand theory and air ticket demand. On the other hand, this study builds on previous studies that found contradictory results on the determinants of air ticket demand. The contribution of this study is linked to the law of demand, which states that, other things remaining constant, when the price of a good or service, such as an air ticket, rises, its amount demanded decreases, whereas when the price of a good or service falls, its amount demanded increases as well (Nicholson & Snyder, 2017). However, in some cases, when prices go up, people continue spending,



and when prices fall, people do not spend more (Rojas & Peterson, 2008). Such contradictory results have necessitated searching for further evidence on this assumption by focusing on air ticket demand, and thus, hypothesis one is formulated as follows: For the purpose of finding further justification to remove this contradiction, this study found that happy (promotional) prices have a negative association with air ticket demand, such that as happy (promotional) prices decrease, there is an increase in air ticket demand, and vice versa.

Moreover, according to previous studies by Hong-Yan et al. (2010), lowering the prices of goods or services helps attract or poach customers from competitors. However, Marand et al. (2021) show that passengers are willing to purchase air tickets at higher prices if there is assurance of the fastest and most reliable service. This study provides more evidence on the side that a happy (promotional) price has a positive association with air ticket demand. Furthermore, Yang et al. (2018) found that there is competition for passengers between high-speed railways and airlines. However, Takebayashi (2018) claimed that the presence of high-speed railways increases the number of passengers who purchase air tickets when hubs are created. This study provides more evidence on the side that high-speed railways and airlines compete for passengers, such that there is a positive association between train price and air ticket demand. This means that as train prices increase, air ticket demand will also increase, and vice versa.

Similarly, Desmet and Parente (2010) and Li et al. (2010) argued that the size of the population influences the demand for goods and services in a particular area. However, according to Hassan and Salim (2011), the influence of population size on demand for goods and services depends on the purchasing power of the population in that particular area. This means that the more purchasing power the population has, the more air tickets are demanded, and vice versa. This study revealed a positive association between the Molde population and air ticket demand. On the other hand, various scholars such as Duro (2016), Coshall et al. (2015), Rosselló and Sansó (2017), Vatsa (2021), Rosselló and Sansó (2017), Chi & Baek (2012), and Coshall et al. (2015) revealed the existence of seasonal variation in demand for goods and services. Seasonal variation varies across goods or services, such that variation in air ticket demand cannot be the same as variation in bus fare demand. This study provides evidence that there is seasonal variation in air ticket demand from March to November in a year for the link between Oslo and Molde.

In order for airlines operating locally to meet high air-ticket demand, the necessity of understanding key determinants of air-ticket demand is inevitable. The introduction of promotional prices in the air industry is essential for attracting more passengers. Similarly, understanding the association between the price of high-speed railways and air ticket demand is necessary for the planning of airline routes. The current construction of high-speed railways in various regions necessitates that management consider possible competition that might exist between airlines and trains. Moreover, airline managers are advised by this study to consider the population of the destination when planning for aircraft in a particular link. Similarly, airline managers should clearly understand the seasonal variation in air ticket demand on a monthly basis to determine the size of aircraft to operate. For high seasons, large aircraft should be used, while for low seasons, small aircraft should be used.

## **8. Conclusion**

The study focused on examining the determinants of air ticket demand based on the link between Oslo and Molde in Norway. The study is useful to developing countries such as Tanzania, which is currently engaged in the construction of high-speed railways. From this study, it can be noted that happy (promotional) price, train price, population, and seasonal variation have a significant influence on air ticket demand. The findings of this study articulate that there is a negative association between air ticket price and air ticket demand; a positive association between train price and air ticket demand; and a positive association between population and air ticket demand. Moreover, the study finds that there is a seasonal variation in air ticket demand: air ticket demand in March is more than air ticket demand in January; air ticket demand in April is more than air ticket demand in January; air ticket demand in May is more than air ticket demand in January; air ticket demand in June is more than air ticket demand in January; air ticket demand in July is more than air ticket demand in January; air ticket demand in August is more than air ticket demand in January; air ticket demand in September is more than air ticket demand in January; air ticket demand in October is more than air ticket demand in January; and air ticket demand in November is more than air ticket demand in January. These findings contribute to demand theory, the air industry, and provide a lesson for developing countries like Tanzania. Thus, from the findings of this study, it is imperative to understand key determinants of air ticket demand in order to properly plan and manage the air industry.

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