Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 05, pp.51578-51583, May, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

ELASTICITY OF DEMAND FOR DOMESTIC AIR TRANSPORT IN VIETNAM BY PRICE AND INCOME

***Nguyen Hai Quang**

Training Department, Vietnam Aviation Academy, Vietnam

ARTICLE INFO

Article History:
Received 27th February, 2017
Received in revised form
30th March, 2017
Accepted 07th April, 2017
Published online 31st May, 2017

Key words:

Elasticity of market demand,
Air transport,
Prices,
Per capita income.

ABSTRACT

This study aims to determine the elasticity of demand for domestic air transport in Vietnam by air fare and per capita income. From the theoretical base and forming of research model, this study analyzes data of airlines of Vietnam for the period of 10 years from 2007 to 2016. The results show that air fare and per capita income are important factors affecting the demand for domestic air transport in Vietnam. Accordingly, the elasticity of demand for the whole market by air fare is -0.7047 and the per capita income is 2.3112. For the market operated by traditional airlines or full services carrier (FSC), the elasticity coefficients of demand by air fare and per capita income are -1.7095 and 2.0159 respectively. As to the market operated by the low cost carriers (LCC), the elasticity coefficients by air fare and per capita income are -3.5052 and 5.7514 respectively. The results of this study are the basis for helping airlines of Vietnam and Civil Aviation Authority of Vietnam in market forecasting and selection of appropriate pricing policy.

Citation: Nguyen Hai Quang,. 2017. "Elasticity of demand for domestic air transport in vietnam by price and income", *International Journal of Current Research*, 9, (05), 51578-51583.

INTRODUCTION

Price and income are important factors affecting the demand for air transport. Determining their elasticity of market demand is importance elements for managers of airline to have suitable business policies as well as government planer to have a policy of competition and balanced development between modes of transport. In Vietnam, before 2012 Vietnam Airlines has played a key role in air transport in the domestic market with over 80% market share, the rest mainly was operated by Jetstar-Pacific Airlines. However, from 2012 with the appearance of VietJet Air operating under the model of LCC, the competition in air transport in Vietnam domestic market has become fierce. The airlines have been constantly competing against each other by differences and especially by price. In addition, per capita income in Vietnam is constantly increasing. These factors have contributed significantly to the growth in demand for air travel in Vietnam's domestic market. It has increased by nearly 30% a year in recent years and has benefited both the people and the nation. This paper studies the elasticity of air transport demand in Vietnam's domestic market by price and per capita income over the 10-year period from 2007 to 2016 as well as in the market operated by the FSC and LCC. To solve the objective, this study will review the theoreticalbasis and studies involved, design the modelresearch,collect and analyze the data to estimate and test the parameters in the models.

Corresponding author: **Nguyen Hai Quang,**
Training Department, Vietnam Aviation Academy, Vietnam

Theoretical basis and research design

Theoretical basis

Microeconomic theory has shown that demand for goods and services depends on many factors such as the price of goods or services, buyers' income, number of buyers, prices of goods or services substitutes… To measure their impact on market demand people use the elasticity of demand. The elasticity of the demand by a factor indicates when that factor changes by 1%, how much the demand of the goods or services varies with the condition that other factors do not change. Among these factors, prices and income of air transport users are important factors affecting the demand of air transport (Mark Smyth and Brian Pearce, 2008).The elasticity of demand by price is measured to capture the sensitivity of consumer demand for a good or service in response to changes in the price of that particular good or service. The elasticity of demand for air transport by price is measured by the change in demand for air transport when prices change by 1% with other factors do not change (Formula 1).

$$\text{Price elasticity of demand} = \frac{\%\ \text{Change in quantity demanded}}{\%\ \text{Change in price}} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

In general rule, the relationship between demand and price is a negative relationship. In other words, when other factors do not change, the prices of goods or services increase, the

demand for it tends to decrease and vice versa. This relationship can be in the form of a linear function or a non-linear function (formula 2)

$$Y = a + \alpha P; \textit{ or } Y = aP^{\alpha} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Where:

Y: Demand for goods or services
P: Price of goods or services
a and α: Parameters in the model

As well as the elasticity of demand by price, the elasticity of demand is measured to capture the sensitivity of consumer demand for goods or services in response to changes in consumer incomes. The elasticity of demand for air transport by income is measured by the change in demand for air transport when travelers' incomes change by 1% and other factors do not change (Formula 3).

$$\text{Income elasticity of demand} = \frac{\%\ \text{Change in quantity demanded}}{\%\ \text{Change in income}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

Unlike the impact of prices, in general rule, the relationship between demand and income is a positive relationship. This means that, when other factors do not change, the consumers' income increases, they will be able to buy more, thus the demand for goods and services will increase and vice versa. The same the impact of price, this relationship can be in the form of a linear function or a non-linear function, but the impact of income on demand is positive (formula 4).

$$Y = a + \beta I; \textit{ or } Y = aI^{\beta} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

Where:

I: Income of consumers
a and β: Parameters in the model

The model considers the simultaneous effects of both price and income on demand for goods and services in linear and non-linear models presented in formula 5 below.

$$Y = a + \alpha P + \beta I; \textit{ or } Y = aP^{\alpha}I^{\beta} \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (5)$$

Where:

Y: Demand for goods or services
P: Price of goods or services
I: Income of consumers
a, α and β: Parameters in the model

Research overview

To forecast the air traffic of global or regional market in the world, Mark Smyth and Brian Pearce (2008) under the International Air Transport Association (IATA) estimated the relationship between air traffic and air travel price and other factors that may impact on air travel, such as gross domestic product, population levels, route distance and seasonality. They used the exponential model and then transferred to log-log model formulas (both the dependent and independent variables have been transformed by the natural logarithm) and the estimation method is Ordinary Least Squares (OLS).Also using OLS and exponential models as Mark Smyth and Brian Pearce (2008), in the limit of national air transport markets, there are some empirical studies were conducted. First of all, the Australia's Bureau of Transport and Communications Economics (1995) estimated the elasticity of air travel demand by airfare and income for each market segment from/to Australia as well as the leisure travellers and business travelers which based on the statistical data over period of 10 years from 1986 to 1994. Next, Lorenzo Castelli *et al.* (2003) studied air travel demand in the Italia's market for the period from 1999 to 2002. They used the independent variables such as population, GDP per capita, airfare, frequency, aircraft capacity to determine the elasticity of air travel demand by airfare and other factors for business and economy class. For the domestic air transport market, Fredrik Kopsch (2012) measured the elasticity of air travel demand by airfare, cross-price of transport means substitutes such as rail and road, as well as the effects of GDP per capita and population on the aviation market in Sweden by using the data from 1980 to 2007; or Caglar Demirsoy (2012) studied the short-term and long-term effects of income, population, price of high speed rail and oil price on domestic air travel in Turkey's market for the period 1980-2011.Also studying in the limit of national air transport markets and OLS method, but using the linear model,Megersa A. Abate (2013) estimated the effects of the price (per passenger-km), number of flights, population and income (per capita GDP) on the intra-African air transport market by data of 20 routes from/to Addis Ababa in the period from 2000 to 2005. The same approach, Craig Gallet and Hristos Doucouliagos (2014) measured the income elasticity of air travel, but in some markets of Asia Pacific.Empirical research on elasticity of demand by price and income is not only done for the air travel market, but also for many industries in different markets. For example, the study by Dermot Gately and Hillard G. Huntington (2001) on the asymmetric effects of changes in energy and oil demand for 96 of the world's largest countries by analyzing data of 1971-1997period; Patrick S. McCarthy (1996) studied the elasticity of demand which based on an extensive household survey of new vehicle purchasers in 1989; or Nguyen Huu Dung and Nguyen Ngoc Thuyet (2015) studied the effect of income and price decides on household food expenditure in Vietnam from data sets for 10 food groups in 2012.

Design research model

From the theoretical base and some related studies, the elasticity of demand for air passenger transport by price and income in the domestic market of Vietnam is formed by the models in formula 6 and 7 below.

Linear model

$$Y_j = a_j + \alpha_j P_j + \beta_j I; \textit{ or } Y_j = a_j + \alpha_j P_j \textit{ and } Y_j = a_j + \beta_j . I \ldots\ldots\ldots \quad (6)$$

Non-linear model

$$Y_j = a_j P_j^{\alpha_j} I^{\beta_j}; \textit{ or } Y_j = a_j P_j^{\alpha_j} \textit{ and } Y_j = a_j I^{\beta_j} \ldots\ldots\ldots\ldots\ldots\ldots \quad (7)$$

For convenience in estimating the parameters in the model, the formula 7 is converted to a linear form in logarithm (Formula8).

$$\text{Log}(Y_j) = \log(a_j) + \alpha_j . \log(P_j) + \beta_j . \log(I);$$

or $Log(Y_j) = log(a_j) + \alpha_j.log(P_j)$

and $Log(Y_j) = log(a_j) + \beta_j.log(I)$..... (8)

Where

Y_j: Air passenger transported

P_j:Average airfare of passenger in km

I: Per capita income of Vietnam per year

a_j, α_j and β_j: Parameters to estimate

The models are estimated for case of all domestic air transport market in Vietnam and for case of each market operated by FSC and LCC. The variables in the models are referred to in Table 1 below.

Table 1. The variables in the research

Input variables (X_i)		Output variables (Y_j)	
P_0:	Average airfare on the domestic market (VND/pax-km)	Y_0:	Total passenger transported on the domestic market by all airlines
P_1:	Average airfare on the domestic market of FSC (VND/pax-km)	Y_1:	Total passenger transported on the domestic market by FSC
P_2:	Average airfare on the domestic market of LCC (VND/pax-km)	Y_2:	Total passenger transported on the domestic market by LCC
I:	Average income per capita of Vietnam (million VND)		

Source: Author's proposal

MATERIALS AND METHODS

Source data

Data was collected from the domestic transportation results of Vietnam in the 10-year period from 2007 to 2016. This market is only operated by Vietnamese airlines according to Vietnamese air transport market access rights.In the early years of period surveyed, the market was operated only by Vietnam Airlines and Jetstar-Pacific Airlines.The market was further operated by Indochina Airlines from 11/2008 to 10/2009, Air Mekong from 10/2010 to 2/2013 and VietJet Air from the beginning of 2012 until now. In these airlines, Jetstar-Pacific Airlines and VietJet Air are the airlines operating under the LCC model. The remaining airlines operate under the FSC model. Data collected includes the total passenger transported on the domestic flight network by all airlines, passengers transported on the domestic flight network by the FSC and the LCC. Average airfares are airfares per kilometers on the domestic flight network of all airline as well as for airline group of FSC and LCC. It is calculated from turnover and passenger-kilometers rotation of airlines. Per capita income of the people of Vietnam is collected through data of the General Statistics Office. Air fares and per capita incomes were converted to fixed 2000 prices according to the annual inflation index (Table 2).

Table 2. Descriptive statistics of research data

Variable	Unit	Minimum	Maximum	Mean	Std. Deviation
Total passengers transported (Y_0)	Million passenger	5643.88	28004.41	13453.00	7122.50
Passengers transported by FSC (Y_1)	Million passenger	4415.26	12120.04	8300.60	2352.94
Passengers transported by LCC (Y_2)	Million passenger	1228.62	15884.38	5152.68	5046.58
Average air fares of all airlines (P_0)	VND/km	367.00	816.00	605.00	134.53
Average air fares of FSC (P_1)	VND/km	502.00	878.00	691.40	103.92
Average air fares of LCC (P_2)	VND/km	273.00	618.00	439.00	101.78
Per capita income (I)	Million VND/year	20686.00	32950.00	26700.00	3951.99

Source: Processing from data collected by airlines

Method of parameter estimation and model selection

Parameters of elastic coefficients in formula 6 and 8 are estimated by the Ordinary Least Square (OLS) method of Eview software.Parameters are accepted when statistic values $|$t-Statistic$| \geq 2$ or Prob. ≤ 0.05. The modelsare accepted when the value of Adjusted R^2 is greater than or equal to 50%and the statistical value of F-statistic is less than or equal to 0.05. When the model using both variables price and incomes are not appropriate, they will be estimated by the model of each influence variable.

In case both linear and non-linear models are accepted, they will be based on the coefficient of determinants to see which one is better.It means comparing the coefficient of determinant of the linear regression model (adjusted R^2) with the correlation coefficient (r) between the actual value and its estimated value through the logarithm function, the model having better coefficient will be chosen (Nguyen Trong Hoai, 2005).

RESULTS

Elasticity of demand for domestic air transport market operated by all airlines

Estimation of the elasticity of demand by air fare and per capita income for domestic air transport market in Vietnam shows that only the non-linear function has the t-Statistic ≥ 2 and Prob. ≤ 0.05 for all parameters. The linear function does not satisfy these conditions. Hence, the nonlinear model is chosen (Table 3).

Table 3. Parameters of the models for both variables of market operated by all airlines

	$Y_0 = a_0 + \alpha_0 P_0 + \beta_0 I$			$\mathbf{Y_0 = a_0 P_0^{\alpha_0} I^{\beta_0}}$		
	a_0	α_0	β_0	$C_0=log(a_0)$	α_0	β_0
Coefficient	11370.15	-30.0482	0.7585	-9.6494	-0.7047	2.3112
t-Statistic	0.5675	-2.2402	1.6611	-3.5199	-5.7884	11.6794
Prob.	0.5881	0.0601	0.1406	0.0097	0.0007	0.0000
Adjusted R^2	0.934346				0.994795	
F-statistic	65.04120				861.0326	
Prob(F-statistic)	0.000030				0.000000	

Source: Estimated results from data surveyed

Nonlinear model gives Adjusted R^2 = 99.48%> 50% and Prob (F-statistic) are almost zero <0.05. This shows that the input variables explain about 99.48% variation of the output variable and the research model is appropriate to be able to apply in practice. The model of elasticity of demand for domestic air transport market in Vietnam by air fare and per capita income is established as follows:

$\text{Log}(Y_0) = -9.6494 + -0.7047 * \log(P_0) + 2.3112 * \log(I)$

$Or Y_0 = 6.446 * 10^{-5} * P_0^{-0.7047} * I^{2.3112}$

Elasticity of demand for domestic air transport market operated by FSC

Estimation of the elasticity of demand by air fare and per capita income for domestic air transport market in Vietnam operated by FSC shows that both linear and non-linear models have only income per capita variable with t-statistic statistic ≥ 2 and Prob. ≤ 0.05. The air fare variable does not meet these conditions (Table 4).

Table 4. Parameters of models for both variables in case market operated by FSC

	$Y_1 = a_1 + \alpha_1 P_1 + \beta_1 I$			$Y_1 = a_1 P_1^{\alpha_1} I^{\beta_1}$		
	a_1	α_1	β_1	$C_1=\log(a_1)$	α_1	β_1
Coefficient	-4421.633	-2.069312	0.529770	-12.6945	0.0721	2.0826
t-Statistic	-0.711672	-0.452907	4.409703	-1.7169	0.1624	4.5141
Prob.	0.4997	0.6643	0.0031	0.1297	0.8756	0.0028
Adjusted R^2	0.931491			0.908562		
F-statistic	62.18516			45.71350		
Prob(F-statistic)	0.000035			0.000096		

Source: Estimated results from data surveyed

Therefore, the models are run for each variable such as the air fare and per capita income. Estimation of the elasticity of demand by air fare for domestic air transport market operated by FSC shows that both linear and non-linear models are given t-Statistic ≥ 2 and Prob. ≤ 0.05, but the correlation coefficient (r) of the nonlinear function (86.31%) is higher than the adjusted R^2 of the linear function (77.35%). Therefore the nonlinear function is chosen.

Equally, estimation of the elasticity of demand by per capita income for domestic air transport market operated by FSC shows that both linear and non-linear models are given t-Statistic ≥ 2 and Prob. ≤ 0.05, but the correlation coefficient (r) of the nonlinear function (96,34%) is also higher than the Adjusted R^2 of the linear function (93,83%). Therefore, the nonlinear function is also chosen for this case (Table 5).Table 5 also shows that the nonlinear models having the elasticity of demand by price or per capita income for domestic air transport market operated by FSC give both adjusted R^2> 50% and Prob(F-statistic<0.05, so the research models are appropriate and can be applied in practice. The elasticity of demand for domestic air transport market in Vietnam operated by FSC is established as models follows:

By air fare:

$\text{Log}(Y_1) = 20.14305 - 1.7095 * \log(P_1)$;

$or Y_1 = 5.598 * 10^8 * P_1^{-1.7095}$

By per capita income:

$\text{Log}(Y_1) = -11.5452 + 2.0159 * \log(I)$;

$or Y_1 = 9.682 * 10^{-6} * I^{2.0159}$

Table 5. Parameters of the models for each variable in case market operated by the FSC

	Elasticity of demand by price				Elasticity of demand by per capita income			
	$Y_1 = a_1 + \alpha_1 P_1$		$Y_1 = a_1 P_1^{\alpha_1}$		$Y_1 = a_1 + \beta_1 I$		$Y_1 = a_1 I^{\beta_1}$	
	a_1	α_1	$C_1=\log(a_1)$	α_1	a_1	β_1	$C_1=\log(a_1)$	β_1
Coefficient	22291.86	-20.2363	20.14305	-1.7095	-7163.044	0.5788	-11.5452	2.0159
t-Statistic	8.8864	-5.6339	8.2222	-4.5565	-5.3861	11.7415	-5.7367	10.2013
Prob.	0.0000	0.0005	0.0000	0.0019	0.0007	0.0000	0.0004	0.0000
Adjusted R^2	0.773532		0.687088		0.938298		0.919690	
F-statistic	31.74073		20.76208		137.8632		104.0656	
Prob(F-statistic)	0.000491		0.001858		0.000003		0.000007	
Correlation (r)			0.863059				0.963752	

Source: Estimated results from data surveyed

Elasticity of demand for domestic air transport market operated by LCC

As to the domestic air transport market in Vietnam operated by the LCC, the results of the estimation of the elasticity of demand by air fare and per capita income shows that both linear and non-linear models have both air fare variable and per capita income variable do not satisfy with t-Statistic ≥ 2 and Prob. ≤ 0.05 (Table 6). Hence, the models are also run for each variable such as the air fare and per capita income.Like the market operated by FSC, estimation of the elasticity of demand by air fare for domestic air transport market operated by LCC shows that both linear and non-linear models are given t-Statistic ≥ 2 and Prob. ≤ 0.05, but the correlation coefficient (r) of the nonlinear function (97.63%) is higher than the Adjusted R2 of the linear function (75,88%).

Therefore the nonlinear function also is chosen. Equally, estimation of the elasticity of demand by per capita income for domestic air transport market operated by LCC also shows that both linear and non-linear models are given t-Statistic ≥ 2 and Prob. ≤ 0.05, but the correlation coefficient (r) of the nonlinear function (98,29%) is also higher than the Adjusted R2 of the linear function (77,57%). Therefore, the nonlinear function is also chosen for this case (Table 7). Table 7 also shows that the nonlinear models having the elasticity of demand by price or per capita income for domestic air transport market operated

by LLC give both adjusted R^2> 50% and Prob(F-statistic) <0.05, so the research models are appropriate and can be applied in reality. The elasticity of demand for domestic air transport market in Vietnam operated by LCC is established as models follows:

By air fare:

$Log(Y_2) = 29.3959 - 3.5052 * log(P_2)$;

or $Y_2 = 5.841 * 10^{12} * P_2^{-3.5052}$

By per capita income:

$Log(Y_2) = -50.4077 + 5.7514 * log(I)$;
or $Y_2 = 1.283 * 10^{-22} * I^{5.7514}$

Table 6. Parameters of models for both variablesin case market operated by LCC

	$Y_2 = a_2 + \alpha_2 P_2 + \beta_2 I$			$Y_2 = a_2 P_2^{\alpha_2} I^{\beta_2}$		
	a_2	α_2	β_2	$C_2=\log(a_2)$	α_2	β_2
Coefficient	-6633.09	-17.0243	0.7209	-13.5053	-1.6912	3.1337
t-Statistic	-0.1988	-0.5699	0.9371	-0.5181	-1.4579	1.6521
Prob.	0.8481	0.5866	0.3799	0.6204	0.1882	0.1425
Adjusted R^2		0.755058			0.907658	
F-statistic		14.87173			45.23181	
Prob(F-statistic)		0.003018			0.000099	

Source: Estimated results from data surveyed

Table 7. Parameters of the models for each variable in case market operated by the LCC

	Elasticity of demand by price				Elasticity of demand by per capita income			
	$Y_2 = a_2 + \alpha_2 P_2$		$Y_2 = a_2 P_2^{\alpha_2}$		$Y_2 = a_2 + \beta_2 I$		$Y_2 = a_2 I^{\beta_2}$	
	a_2	α_2	$C_2=\log(a_2)$	α_2	a_2	β_2	$C_2=\log(a_2)$	β_2
Coefficient	24445.62	-43.9474	29.3959	-3.5052	-25371.86	1.1426	-50.4077	5.7514
t-Statistic	6.6999	-5.4140	11.7481	-8.4935	-4.6658	5.6684	-7.5734	8.8001
Prob.	0.0002	0.0006	0.0000	0.0000	0.0016	0.0005	0.0001	0.0000
Adjusted R^2	0.758790		0.887697		0.775732		0.894665	
F-statistic	29.31182		72.14017		32.13055		77.44199	
Prob(F-statistic)	0.000635		0.000028		0.000471		0.000022	
Correlation (r)			0.976250				0.982928	

Source: Estimated results from data surveyed

Conclusions and policy implications

This study shows that air fare as well as per capita income are factors affecting domestic air transport market of Vietnam and this relationship is in the form of exponential (non-linear). This impact is also proper with the general rule of demand for goods and services. To be more specific, the price has a negative impact on demand, but the per capita income has a positive affects on demand. Accordingly, the elasticity of demand for the whole market by price is -0.7047 and the per capita income is 2.3112. For the market operated by FSC, the elasticity coefficients of market demand by prices and per capita income are -1.7095 and 2.0159 respectively.As to the market operated by LCC, the elasticity coefficients are -3.5052 and 5.7514 respectively. This means that while other factors remain unchanged, when increasing air fare by 1%, the demand for domestic air transport market in Vietnam will decrease by 0.7047%. Besides, if increasing per capita income by 1%, the demand for domestic air transport market in Vietnam will rise by 2.3112%.The corresponding figures for the market operated by FSC were 1.7095% and 2.0159% respectively, the market operated by LCC were 3.5025% and 5.7514% respectively.This result also shows that the demand for market operated by the LCC has higher elasticity of air fare and per capita income than the demand for market operated by FSC.The results of this research help airlines of Vietnam and Civil Aviation Authority of Vietnam be able to forecast the demand for air transport market on domestic routes in Vietnam through its elastic coefficient by air fare and per capita income. Elasticity of demand for each market also is a basis for airlines to select the right pricing policy to compete, maximize revenue and improve business efficiency.

REFERENCES

Bureau of Transport and Communications Economics of Australia, 1995. Demand Elasticities for Air Travel to and from Australia. *Working Paper 20*. Printed by the Department of transport, Canberra.

Caglar Demirsoy, 2012. Analysis of stimulated domestic air transport demand in turkey what are the main drivers?. *Thesis of Master: Economics and Business in specialization Urban*, Port and Transport Economics.

Craig Gallet and Hristos Doucouliagos, 2014. The income elasticity of air travel: A meta-analysis. *Annals of Tourism Research*. Vol. 49, p. 141–155.

Dermot Gately and Hillard G. Huntington, 2002. The Asymmetric Effects of Changes in Price and Income on Energy and Oil Demand. *Energy Journal*. Vol. 23, Issue 1, p.19-55.

Fredrik Kopsch, 2012. A demand model for domestic air travel in Sweden. *Journal of air transport management*. Vol. 20, p. 46-48.

General Statistics Office. *Socio-economic situation.*Access on 20/1/2017, from http://www.gso.gov.vn/

Lorenzo Castelli, Walter Ukovich &Raffaele Pesenti, 2003. An airline-based multilevel analysis of airfare elasticity for passenger demand. *The Conference Proceedings of the 2003 Air Transport Research Society (ATRS) World Conference*. Vol. 2, Washington, DC, United States.

Mark Smyth and Brian Pearce, 2008. Measuring the responsiveness of air travel demand to changes in prices and incomes. *IATA Economics Briefing No 9: Air travel demand*.

Megersa A. Abate, 2016. Economic Effects of Air Transport Liberalization in Africa. *Transportation Research Part A: Policy and Practice*. Vol. 92, p. 326-337.

Nguyen Huu Dung and Nguyen Ngoc Thuyet, 2015. Assess the impact of income and food prices on decisions of household consumption in Vietnam. *Journal of Economic Development*. No. 26 (6), p. 75-94.

Nguyen Trong Hoai, 2005.*Quantitative research methods.*University of Economics Ho Chi Minh City.

Patrick S. McCarthy, 1996. Market Price and Income Elasticity of New Vehicle Demands. *The Review of Economics and Statistics*. Vol. 78, No. 3, p. 543-547.

VietJet Air Joint Stock Company. *Annual financial report*. Access on 15/1/2017, from http://finance.vietstock.vn/HVN-tct-hang-khong-viet-nam-ctcp.htm.

Vietnam Airlines Corporation. *Annual reports and financial statements*. Access on 20/1/2017, from http://finance.vietstock.vn/HVN-tct-hang-khong-viet-nam-ctcp.htm.

****