Cruise travelers' satisfaction at a port of call

Maritime Policy & Management, 2015

Young-Tae Chang, Shu-min Liu, Hyosoo Park, Younghoon Roh Graduate School of Logistics, Inha University.

Contents

- Introduction
- Literature review
- Methodology
- Results and discussions
- Conclusion

1. Introduction

1.1. Context of the study



Capacity deployment of cruise ships in 2013. Source: Cruise Lines International Association (2013)

- The cruise industry is
 dominated by North America
 and Europe market.
- The annual number of passengers in Asia increased from 0.85 million to 1.27 million in 2010 (growth rate 4.8%).

Growing number of ports are inducing cruise ships to diversify their business.

1. Introduction

1.1. Context of the study



- Port of Incheon (POI), Korea received cruise passengers since 2007, and the government paid great attender to its strategic importance
- The number of passengers increased from 1,673 in 2007 to 159,879 in 2013.
- POI is preparing its transition to homeport for cruiseships.

1. Introduction

1.2. Framework for Measuring Satisfaction



2. Literature review

2.1. Classification of cruise travelers' satisfaction studies

	Mediterranean / North America	Asia
Onboard ships	Teye and Leclerc (1998) Petrick (2004) Andriotis and Agiomirgianakis (2010) Huang and Hsu (2010)	None
Outside ships	Brida et al. (2012)	Qu and Ping (1999)

2. Literature review

2.2. Expectancy Disconfirmation Paradigm / Service Quality Paradigm

- Oliver (1980): conceptualized the cognitive process from customer's expectation to revised attitude.
- Parasuraman *et al.* (1985): defined "disconfirmation" to explain service quality (SERVQUAL model).
- Cronin and Taylor (1992): criticized for SERVQUAL model and advocated perception-only model.
- Yuksel and Yuksel (2001): theoretical and empirical criticism for the SERVQUAL model.
- Hui *et al.* (2007): applied SERVQUAL and perception-only model in the context of tourism industry.

2. Literature review

2.3. Contribution of the study

- The cruise satisfaction survey has rarely been conducted in Asia.
- Using the paired samples, we prevented the potential bias of satisfaction measure (Yüksel and Rimmington
- By collecting the paired samples, we obtained unbiased results comparing the EDP model and perception-only model.

3. Methodology

- 3.1. Questionnaire design / data collection
 - Two types of questionnaires were distributed before and after the tour.
- The total of 21 five-point likert type questions were extracted from Heung and Quf (2000) and Hung and Petrick (2011).
- The travelers in two cruise ships were targeted (Costa Atlantica in October 12, 2013; the Mariner of the Seas in October 22).
- Some reliable guides were selected to collect questionnaires.
- Total of 97 samples were collected out of 400 circulated ones (MacCallum et al., 1999; Bryant, F. B., & Yarnold, P. R., 1995).

3. Methodology

3.2. Overview of the analysis

Summarize passengers expectation: Factor analysis.

Measure the *disconfirmation* levels: Paired t-test, averaging factor scores.

Compare the explonatory power of EDP and perceptions-only model on overall satisfaction: Ordinary least squares.

Measure the impact of overall satisfaction on revisit/ recommendation intention: Logit regression.

4. Results

4.1. Demographic description

Gender



4. Results

4.2. Factors of travelers' expectation

Expectation dimension	Factor Loading
Factor 1: Overall convenience / People	
α=0.943, construct reliability=0.945, variance extracted = 0.811	
Item1. People working at restaurants/shops in Incheon/Seoul should be helpful and efficient.	0.90
Item2. Local people should be friendly and courteous.	0.94
Item3. Incheon/Seoul should be a clean and tidy place.	0.91
Item4. Immigration and customs procedures should be convenient.	0.85
Factor 2: Culture / Exploration	
α=0.923, construct reliability=0.925, variance extracted = 0.712	
Item5. Incheon/Seoul area should have an interesting night life.	0.79
Item6. I would like to gain knowledge of Incheon/Seoul.	0.90
Item7. There should be interesting traditional cultural events.	0.89
Item8. There should be appealing Korean drama/movie sets.	0.78
Item9. The climate and weather should be acceptable.	0.85
Factor 3: Commodities / Attractions	
α=0.953, construct reliability=0.955, variance extracted = 0.809	
Item10. There should be many different kinds of commodities.	0.92
Item11. There should be convenient shopping malls.	0.90
Item12. Incheon/Seoul area should have attractive urban sightseeing.	0.93
Item13. Incheon/Seoul area should have attractive natural and scenic places.	0.86
Item14. Incheon/Seoul area should be a safe place to visit.	0.89

5. Conclusion / limitation

- Three factors, "Culture / Exploration", "Overall convenience / People", and "Commodities / Attractions", were extracted from the analysis, where the "Culture / Exploration" factor explained most of the overall satisfaction.
- Empirically, the perception-only model outperforms the EDP model.
- The overall satisfaction has greater impact on the recommendation rather than revisit intention.
- More samples need to be collected to draw more robust results.

Economic contribution of cruise industry

Maritime Policy & Management, 2015

Output Institution

Methodology

Results

□Conclusion / limitation



1. Motivation

- The domestic cruise market in Korea

•The number of cruise passengers in domestic ports grew rapidly from 69,000 in 2008 to 276,000 in 2012.

•Passenger flow in Port of Incheon (POI) also jumped as shown in the table.

•POI currently serves as a secondary port of cruise lines. In a while, they are expanding berth dedicated to cruise ships to be developed into homeport.

Year	2007	2008	2009	2010	2011	2012
Ships	3	5	15	13	31	8
Passengers	1,627	2,573	7,223	7,536	30,454	6,538

Table. The number of cruise passengers in Port of Incheon

Source: Port of Incheon



- Contribution of the study

•Previous studies regarding to the cruise industry mainly focus on the Carrebian and Mediterranean market (Braun, 2002). No study quantified the economic impact of the cruise industry in Asian market.

•The methodology/the cruise industry classification of the similar studies are quite descriptive, which makes their validity suspicious.

•This study fill in this gap by quantifying the economic impact of the cruise industry in POI applying a regional IO analysis.

•The study also conducts scenario analysis to justify the hinternald development of Inchoen.



- a regional IO analysis

- A regional IO analysis analyzes regional economy in macroecnomic perspective. It computes the circular effect of direct consumption in a specific industry to regional economy.
- Production, labor, value-added effect of a certain industry can be calculated.
- Even the industry not specified in a regional IO table can be analyzed by manipulating the table.



- Defining cruise industry in a regional IO table

Table. The industries associated with the cruise industry

Region	Sector	Secondary data	
	Transportation Construction	Incheon Port Authority, 2012	
Incheon	Water-related secondary service	Incheon Port Authority, 2011	
	Road Transportation	Statistics Korea, 2012	
	Wholesale and Retail trade	Korean Ministry of Culture, Sports, and Tourism, 2012	
Secul	Catering service		
Seoul	Recreational Service		
	Cultural Service		



- The inducing effect of the cruise industry

Inducing effect	Production Coefficient	Production (million won)	Value added (million won)	Labor (persons)
Incheon	0.104	21,460	7,137	96
Seoul	0.247	50,762	24,804	409
Other region	0.365	74,873	21,346	333
Total	0.717	147,096	53,287	837

Table. The inducing effects of the cruise industry in POI

- Scenario analysis: what if the cruise industry can be self-sustained in Incheon?

Impacts under	Coefficient	Production	Value added	Labor
Scenario				(persons)
Incheon	0.221	45,402	17,303	295
Seoul	0.151	31,007	16,677	242
Other region	0.361	74,143	20,821	320
Total	0.734	150,552	54,801	856
Percentage deviation	2%	2%	3%	2%

Table. The inducing effects under scenario



- The economic impact in POI is relatively small because it is currently serving as a port of call.
- The visits of cruise ships to POI benefit mostly the economy in Seoul in terms of value-added and job creation.
- The economic impacts of the cruise industry will be greater if shopping centers and tourism attractions are located in Incheon.
- More rigorous review of literature are needed to correctly define the industry in a regional IO table.



Efficiency Analysis of Major CRUSE Lines

0.85

P8()

Tourism Management, 2016



Young-Tae Chang
 Soo-hyung Lee
 Hyo-soo Park

Graduate School of Logistics, Inha University, Incheon, Korea

Keywords: cruise line, efficiency, network DEA, bootstrapped-truncated regression



- I. Background of the cruise industry
- II. Contribution of this paper
- III. Literature review
- IV. Network DEA Model
- V. Network structure
- VI. Bootstrapped truncated regression

VII. Results

VIII.Conclusion/limitations





on



Total revenue	2009	2010	2011	2012	2013	2014	% in 2014
CCL	13,460	14,469	15,793	15,382	15,456	15,884	59%
RCCL	5,890	6,753	7,537	7,688	7,959	8,073	30%
NCL	1,855	2,012	2,219	2,276	2,570	3,125	12%
Total	21,205	23,234	25,549	25,346	25,985	27,082	

Unit: million \$



Packarou	Cruise line	Year	Revenue	Net income	Ratio
Dackgrou	Carnival	2009	\$13,460,000.00	\$1,790,000.00	13%
nc	10 3%	2010	\$14,469,000.00	\$1,978,000.00	14%
Literatur	10.570	2011	\$15,793,000.00	\$1,912,000.00	12%
e		2012	\$15,382,000.00	\$1,298,000.00	8%
NDFA		2013	\$15,456,000.00	\$1,078,000.00	7%
model		2014	\$15,884,000.00	\$1,236,000.00	8%
	Norwegian	2009	\$1,855,204.00	\$66,952.00	4%
Network	5.5%	2010	\$2,012,128.00	\$22,986.00	1%
structure		2011	\$2,219,324.00	\$126,859.00	6%
Regressi		2012	\$2,276,246.00	\$168,556.00	7%
on		2013	\$2,570,294.00	\$102,886.00	4%
¢		2014	\$3,125,881.00	\$342,601.00	11%
Results	Royal Caribbean	2009	\$5,889,826.00	\$152,485.00	3%
	5.6%	2010	\$6,752,504.00	\$515,653.00	8%
Conclusi	5.070	2011	\$7,537,263.00	\$607,421.00	8%
on		2012	\$7,688,024.00	\$18,287.00	0%
		2013	\$7,959,894.00	\$473,692.00	6%
		2014	\$8,073,855.00	\$764,146.00	9%





- I. The First to analyze operational/financial performance of cruise lines.
- II. Used network DEA model
- III. By identifying source of inefficiency, we draw **managerial implications** for cruise lines.

¶ Backgrou	Efficiency	SFA in Tourism
∫nd		Ching-Fu Chen (2006), A. Assaf (2010), Carlos Pestana Barros (2014)
Literatur		DEA in Tourism
e 9 NDEA		Hwang and Chang(2003), Carlos Pestana Barros (2004), Can Deniz Kokal and A. Akin Aksu (2006), A. George Assaf (2011), Ashrafi and Seow(2013), Aurelie Corne (2015)
model		DEA in Shipping or Port
Network structure		Pditras, Tongzon and Li(1996), Panayides, Lambertides and Savva(2010), Wang, Woo and Mileski(2014),
Regressi		Network DEA
on المعالم الم المعالم المعالم		Shiang-Tai Liu(2010), Hsieh and Lin(2009), Prieto and Zofio(2004), Lu, Wang and Kweh(2013)
Results		Bootstrapped Truncated Reg.
¶ Conclusi		Gillen and Lall, (1997), Barros (2004), Zou et al., (2015) Chang et al., (2016) , Simar and Wilson (2007)



Programming model Backgrou **Parameters** Minimize $\rho = \frac{1 - \sum_{k=1}^{2} \sum_{i=1}^{m_k} \frac{w^k s_{ki}^-}{m_k x_{kio}}}{1 + \sum_{k=1}^{2} \sum_{i=1}^{b_k} \frac{w^k s_{ki}^+}{b_k y_{kio}}}$ nd x_{kii} : input *i* observation of DMU *j* at stage *k* Literatur y_{kri} : output *r* observation of DMU *j* at stage *k* **NDEA** z_i : intermediate output observation of DMU j s.t. model m_k : number of inputs at stage k (i) $\sum_{j=1}^{n} \lambda_{kj} x_{kij} + s_{ki} = x_{kio}, \quad k = 1, 2, \ i \in I_k,$ Network b_k : number of outputs at stage k structure w^k : weight imposed on stage k (ii) $\sum_{i=1}^{n} \lambda_{ki} y_{krj} - s_{ki}^{+} = y_{kro}, \quad k = 1, 2, r \in R_{k},$ Regressi on (iii) $\sum_{j=1}^n \lambda_{1j} z_j = \sum_{j=1}^n \lambda_{2j} z_j,$ Decision variables Results λ_{ki} : weight imposed on DMU *j* at stage *k* (iv) $\sum_{i=1}^{n} \lambda_{ki} = 1, \qquad k = 1, 2,$ Conclusi s_{ki}^{t-} : input *i* redundancy at stage *k* s_{ki}^{t-} : output *r* shortfall at stage *k*

Stage efficiency is calculated as





Bootstrapped Truncated Regression

$$f(\mathbf{x}_{i}, \boldsymbol{\eta}_{i}, \boldsymbol{\delta}_{i}, \mathbf{z}_{i}) = f(\mathbf{x}_{i}, \boldsymbol{\eta}_{i} | \boldsymbol{\delta}_{i}, \mathbf{z}_{i}) f(\boldsymbol{\delta}_{i}, \mathbf{z}_{i}) f(\mathbf{z}_{i}),$$

$$\delta_{i} = \hat{\delta}_{i} - Bias(\hat{\delta}_{i}) - u_{i} = \mathbf{z}_{i}\boldsymbol{\beta} + \varepsilon_{i}$$
$$\rightarrow \hat{\delta}_{i} = \mathbf{z}_{i}\boldsymbol{\beta} + \varepsilon_{i} + Bias(\hat{\delta}_{i}) + u_{i}.$$

$$Efficiency_{i} = \beta_{0} + \sum_{n} \delta_{n} X_{n,i} + \varepsilon_{i},$$





















Backgrou nd Literatur ρ NDEA model Network structure Regressi on Results Conclusi on

Den en dent verieble	Overall	Operating	Non-operating	VIF
Dependent variable	Effi.	Effi.	Effi.	
PPP	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	2.63
Total debt to capital	-3.705*** (0.832)	-0.169 (0.172)	-2.534*** (0.512)	5.10
Epidemic	-0.096 (0.122)	-0.084*** (0.029)	-0.046 (0.07)	1.23
Economic crisis	-0.186* (0.105)	0.058** (0.023)	-0.133** (0.061)	1.28
Other accidents	0.05 (0.147)	0.039 (0.051)	0.025 (0.072)	1.21
Payroll	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	6.22
Constant	2.644*** (0.462)	1.097*** (0.126)	1.823*** (0.276)	
Wald statistic	62.755***	13.322**	148.491***	
Observations	41	41	41	

Bootstrapped-truncated regression results













6. **Capacity expansion** is essential to increase market share in the long run. However, the resulting debt burdens can hurt the financial health

7. When expanding capacity and financing from debts, **hedging strategy** is needed (interest rate, fuel price, foreign currency)

