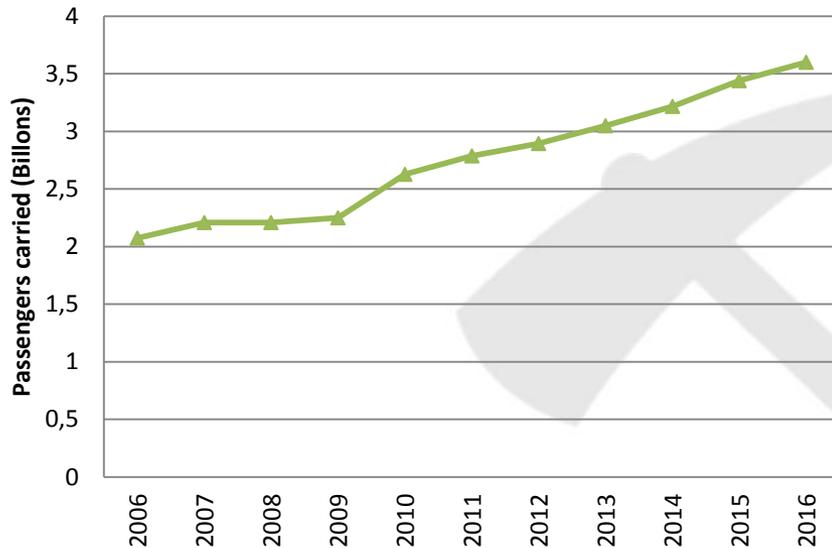


Identifying service quality dimensions as antecedent to passenger satisfaction and behavioral intentions in air transport industry.

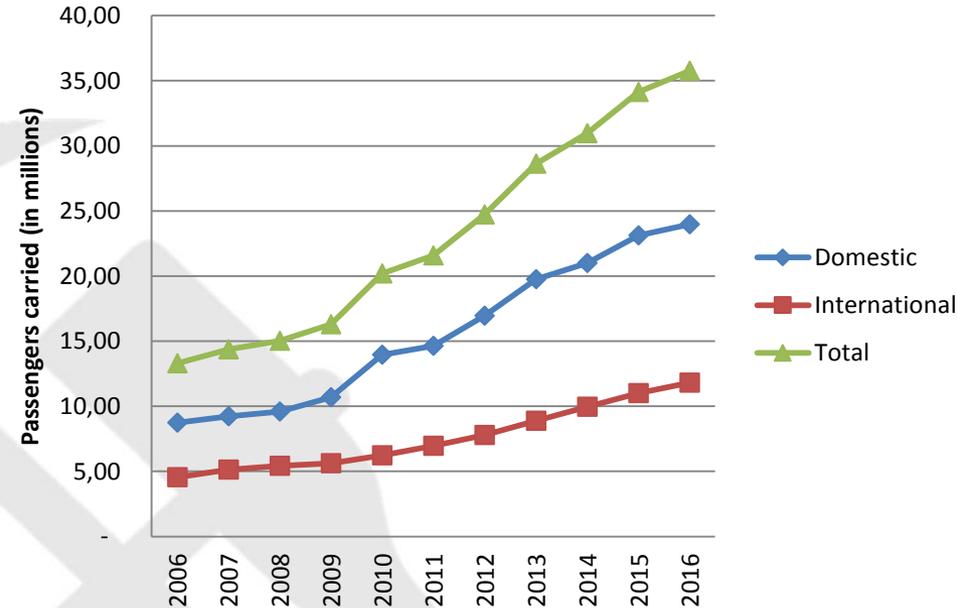
Claudia Muñoz Hoyos
PhD student in civil engineering
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Advisors – Jorge Córdoba. Universidad Nacional
Henry Laniado. Universidad EAFIT

World air passengers



Colombia's air passengers



Competition between airlines has become more intense and service quality of airlines is receiving more attention than ever before.

Customer satisfaction is one of the most important components of the air transportation industry and it is considered to be the core competitive advantage for an airline's profitability. (Park, 2005)

Researchers suggest that service quality is an antecedent of customer satisfaction. (Parasuraman, Zeithaml and Berry, 1985 and Parasuraman, Zeithaml and Berry, 1988)



(Suki, 2014) and (Gures, Arslan and Yucel Tun, 2014)

The customer satisfaction in air transportation has been defined as an essential element of relationship between airlines and their market (Brown and Lam, 2008)

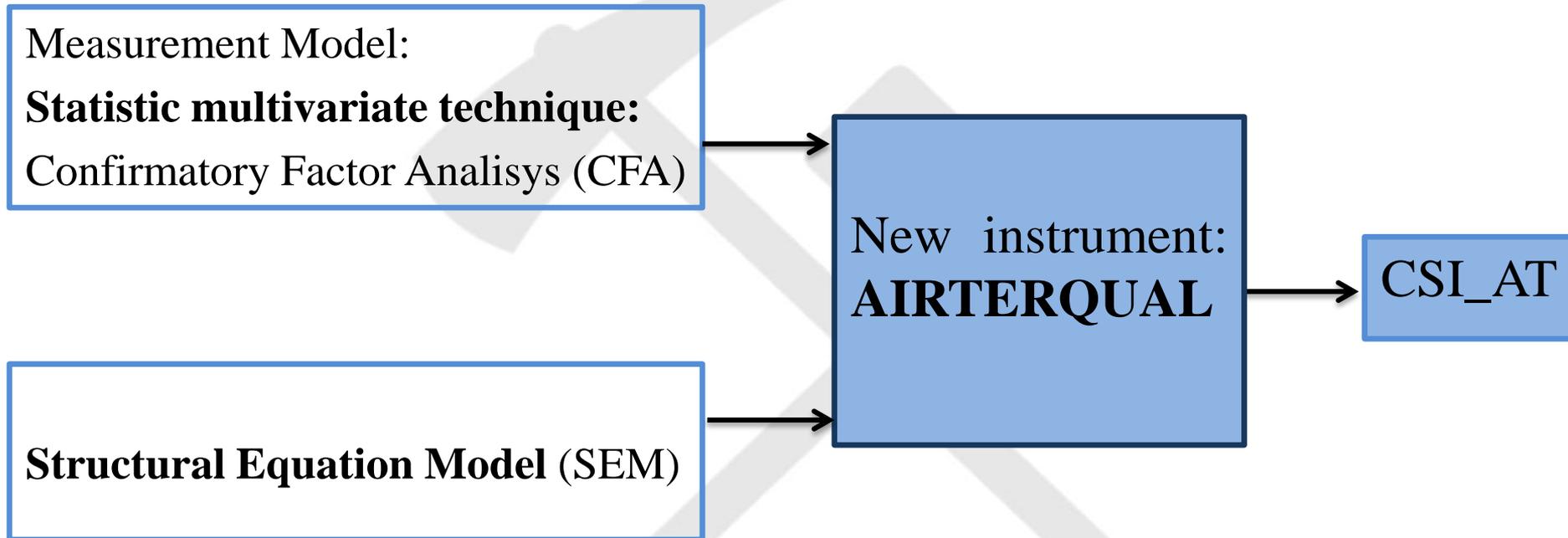


Airline service quality. (Johns and Tyas, 1996; Culiberg and Rojsek, 2010, Wu and Ko, 2013 and Elkhani, Soltani and Jamshidi, 2014)

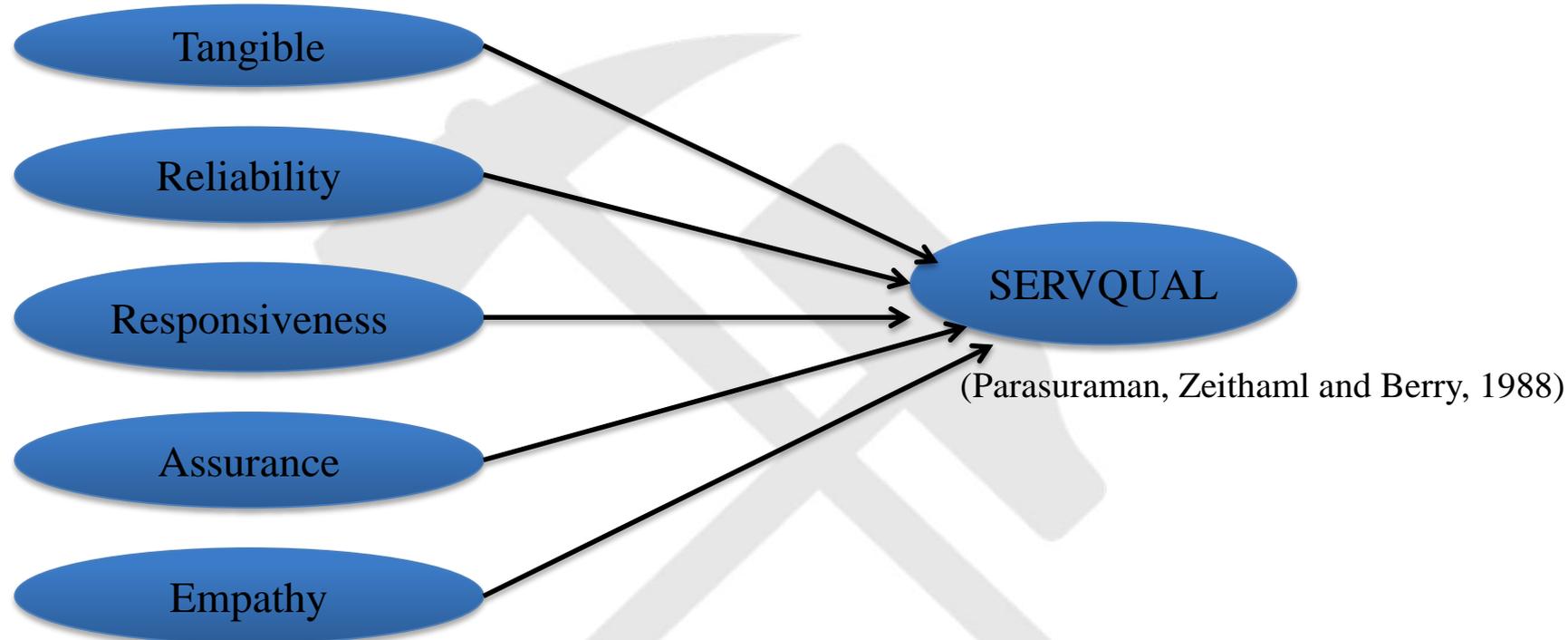


Airport service quality (Correia, Wirasinghe and de Barros, 2008)(Jeon and Kim, 2012) (Bogicevic et al., 2013)

Researchers have tried to assess overall service quality by introducing a new service quality dimension related with departure terminal tangible. (Park, 2010); (Mahmud, Jusoff and Hadijah, 2013) and (Al Nasser and Hussain, 2014)

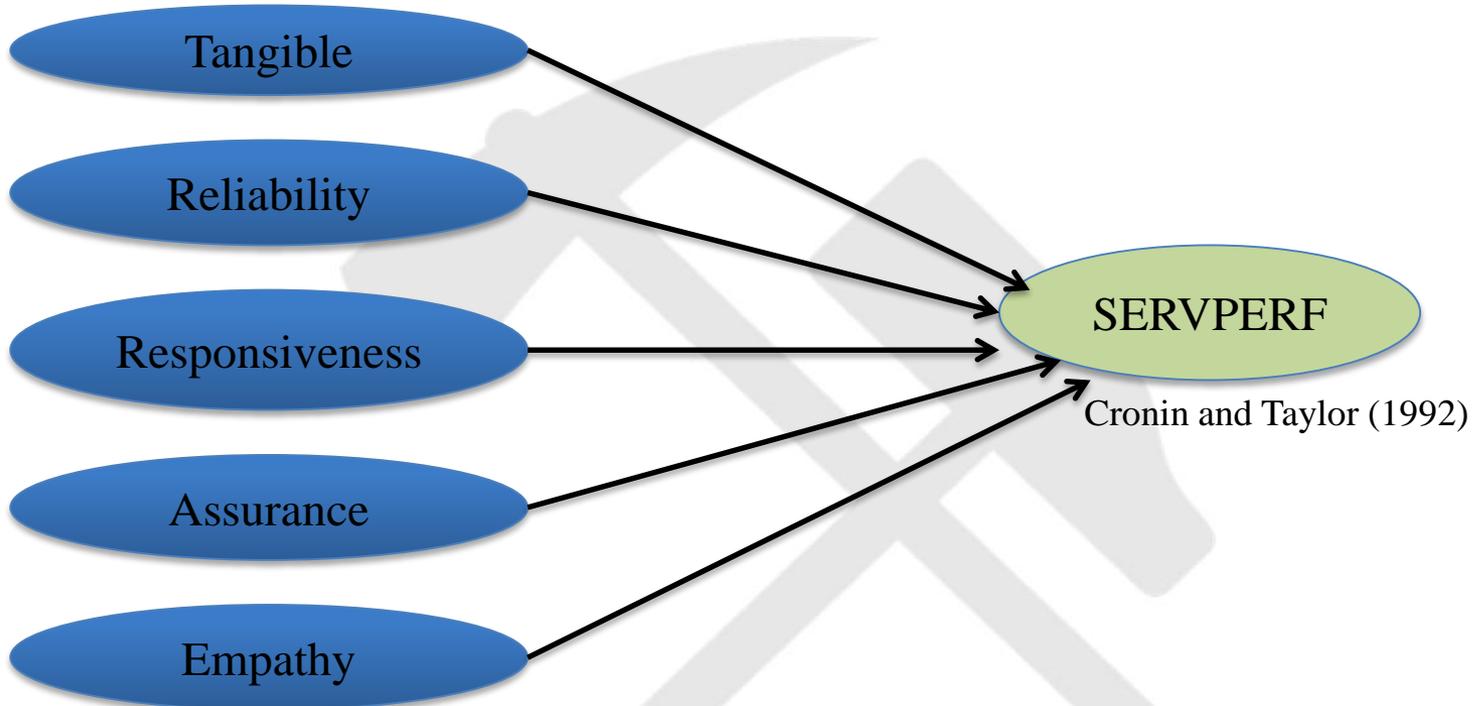


Parasuraman, Zeithaml and Berry (1985) suggested that quality can be measured as the gap between the customers' expectation and their service perceptions.



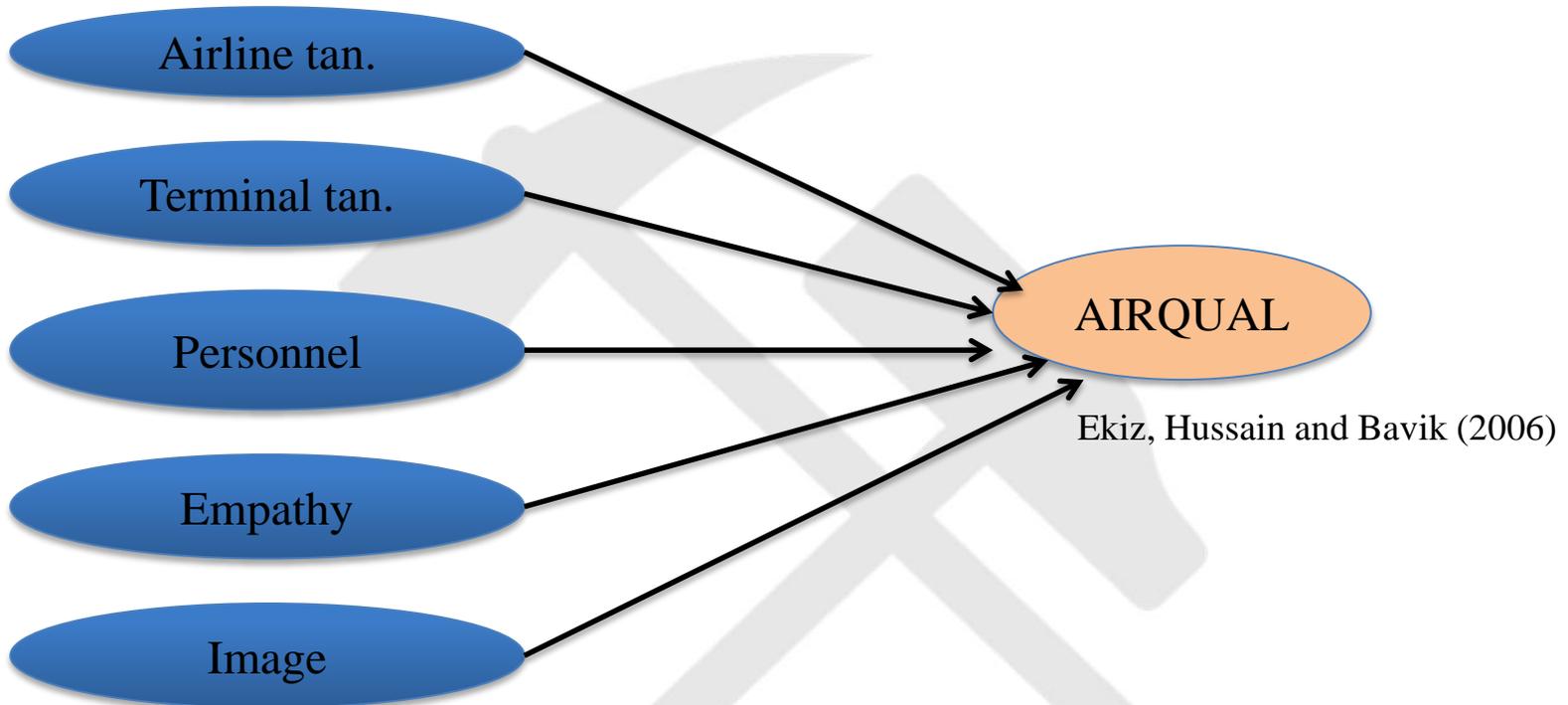
- It compares customers' expectations with customers' perceptions of the services received (Cronin and Taylor, 1992; Buttle, 1996; Robledo, 2001).
- The universality of scale and its dimensions should be assessed in relation to a specific industry. (Johns and Tyas, 1996; Culiberg and Rojsek, 2010 and Wu and Ko, 2013)

SERVPERF scale assesses service quality through customers' perceptions of service provider's performance.



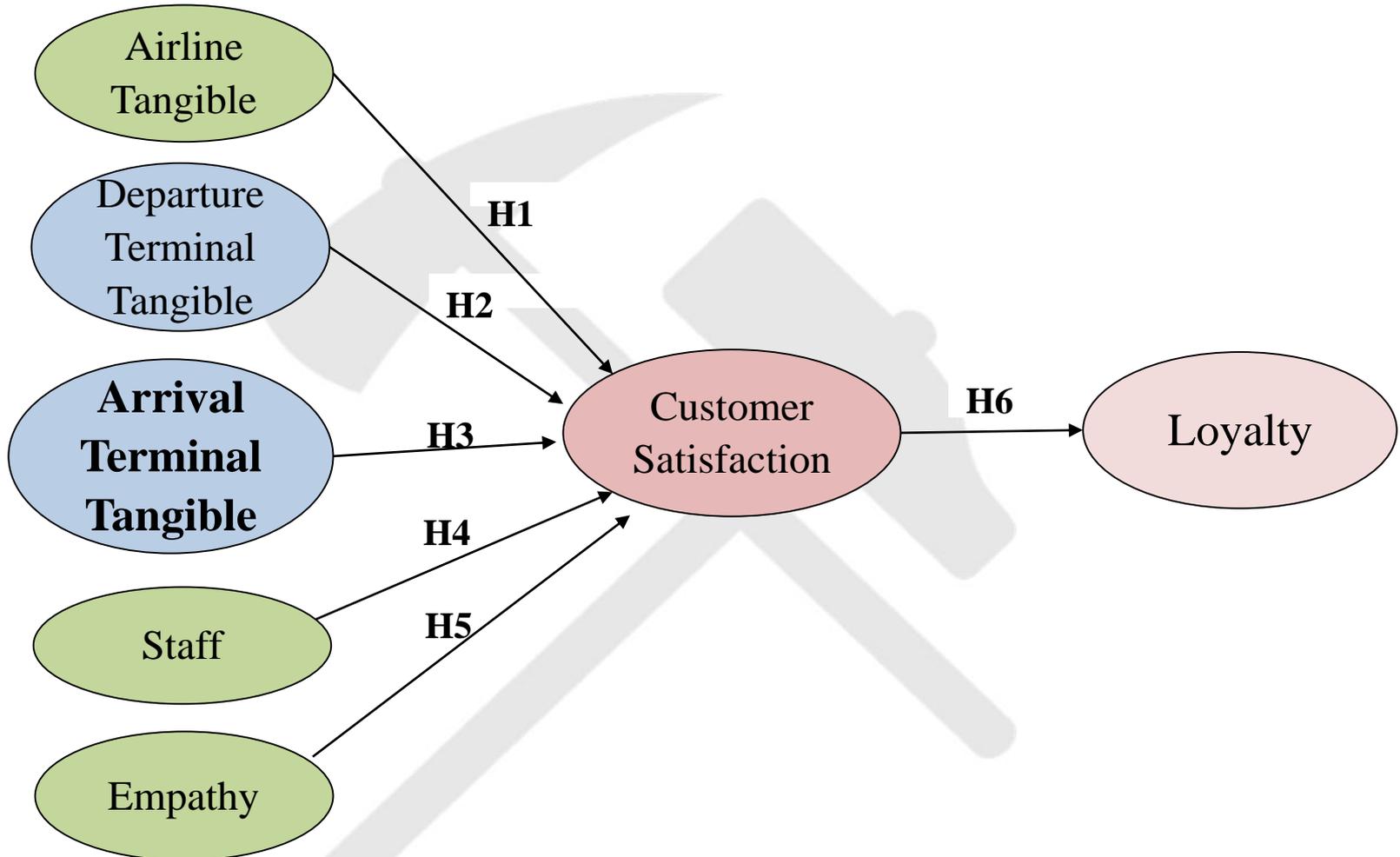
Service quality-Airline industry (Cunningham, Young and Lee, 2004; Abdullah et al., 2012 and Leong et al., 2015).

AIRQUAL was developed to measure the service quality perceptions of airline customers



Air transportation market. (Nadiri et al., 2008; N. M. Suki, 2014; Ali, Lal Dey and Filieri, 2015; Mohamed and Rani, 2016).

AIRTERQUAL Scale



H1: Perceived quality related to airline tangible will have a significant positive effect on customer satisfaction

Parasuraman, Zeithaml and Berry (1988) linked tangible dimension with the appearance of physical assets, equipment, and communication materials.

In airline industry, Khuong and Uyen (2014) associated tangibles factor with in-flight facilities and appearance of staff and cabin crew.

Kim and Lee (2011) and Leong et al. (2015) found that perceived quality related to airline tangible can play a fundamental role in forming customers' satisfaction.

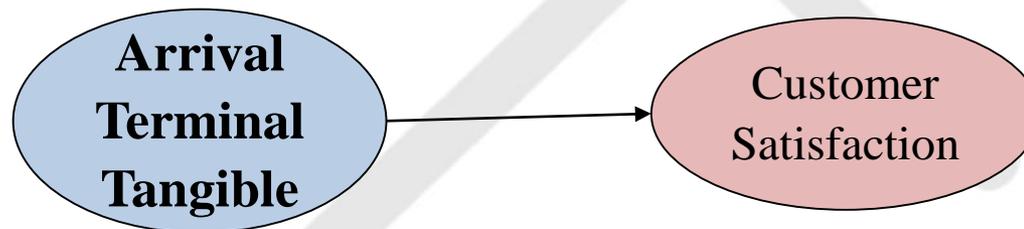
H2: Perceived quality related to departure terminal will have a significant positive effect on customer satisfaction

As a result of increasing traffic and changes in air transport market, airport managers are interested in measuring, analyzing and extracting relevant information regarding passengers' perception on airport service quality (Bezerra and Gomes, 2015)

Nadiri et al. (2008); Al-Refaie et al. (2014) and Ali, Lal Dey and Filieri (2015) found that terminal tangible features influence customer satisfaction.

H3: Perceived quality related to arrival terminal will have a significant positive effect on customer satisfaction

First contact point for passengers when they arrive at their destination. Passengers use different facilities and services that give them the last service quality perception in their trip. (Yeh and Kuo, 2003)



H4: Perceived quality related to staff will have a significant positive effect on customer satisfaction

Customers' perceptions of the employees' performance can play a critical role in customers' assessment of service quality (Aburoub, Hersh and Aladwan, 2011).

Staff dimension

- Ability and willingness to help.
 - Attention
 - Create consumer confidence
- (Babbar, 2008)

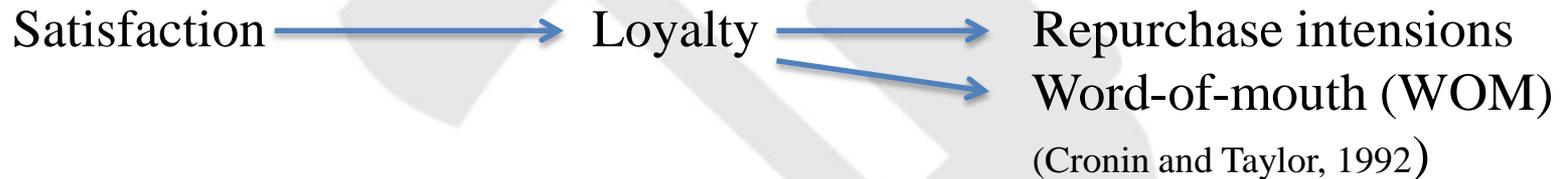
.

H5: Perceived empathy will have a significant positive effect on customer satisfaction

Empathy is related to how a company cares and provides individualized attention to their customers in order to make the customers feel valued and special (Norazah, 2013)

Nadiri et al. (2008); N. M. Suki (2014) and Ali, Lal Dey and Filieri (2015) found that empathy has a significant relationship with customer satisfaction.

H6: Customer satisfaction will have a significant positive effect on brand loyalty.



AIR TRANSPORTATION MARKET

- Nadiri et al., 2008 → Domestic Flights – Cyprus Turkish Airlines
- Kim and Lee, 2011 → Domestic Flights – Korean Airline Market
- Suki, 2014 → International Flights – Malaysia airlines
- Gures et al., 2014 → Dom. and int. Flights – Turkish airline Ind.
- Hussain, et al., 2014 → International Flights – UAE – airline Ind.
- Leong et al., 2015). → Dom. and int. Flights – Turkish airline Ind

- Sample size was 330
- The survey was based on actual performance and it was composed of five sections as follows

1. Demographic information: gender, age, occupation and monthly income

2. latest trip: airline, airfare, average travel time, trip purpose, suitcases taken, departure airport, flight destination, layovers, flight date and FFP membership.

3. Service quality: 6 items for airline tangibles, 14 items for departure terminal tangibles, *14 items for arrival terminal tangibles*, 8 items for staff and 4 items for empathy

4. Satisfaction: 8 items .

5. Loyalty: 4 items of loyalty (repurchase intention and word-of-mouth communication)

The items were measured on a seven-point scale ranging from 1 (extremely disagree) to 7 (extremely agree).

Service quality dimensions

Airline Tangible dimension

Items	Statements
AIR1	Aircraft cleanliness
AIR2	Aircraft modern looking
AIR3	Quality of catering served in the plane
AIR4	Cleanliness of the plane toilets
AIR5	Cleanliness of the plane seats
AIR6	Comfort of plane seats
AIR7	Quality of air conditioning in the plane

Service quality dimensions

Staff dimension	
Items	Statements
PER1	Employees' general attitude
PER2	Whether airline staff give exact answers to my questions
PER3	Employees' experience and education level are adequate
PER4	Employees have the knowledge to answer your questions
PER5	Empathy of the airline staff
PER6	Awareness of airline staff of their duties
PER7	Error-free reservation and ticketing transactions
PER8	Whether staff show personnel care equally to everyone

Service quality dimensions

Empathy dimension

Items	Statements
<i>EMP1</i>	Airlines office locations
<i>EMP2</i>	Transportation between city and airport
<i>EMP3</i>	Compensation schemes in case of loss or hazard
<i>EMP4</i>	Care paid to passengers' luggage
<i>EMP5</i>	Availability of health personnel during the flights
<i>EMP6</i>	Number of flights to satisfied passengers' demand
<i>EMP7</i>	Airline has a useful frequent flyer program

Service quality dimensions

Departure Terminal Tangible dimension

Items	Statements
DT1	Cleanliness of the departure airport toilets
DT2	Number of shops in departure airport
DT3	Parking space availability in departure airport
DT4	Size of the departure airport
DT5	Effective conditioned areas for smokers in departure airport
DT6	Good Signage of departure airport
DT7	Availability of trolleys in departure airport
DT8	Reliability of security control system in departure airport
DT9	Employees' uniform are visually appealing in departure airport
DT10	Comfort of waiting hall of the departure airport
DT11	Availability of wide range of newspaper selection in airport
DT12	Departure airport cleanliness
DT13	Departure airport modern looking
DT14	Quality of air conditioning in the departure airport

Service quality dimensions

Arrival Terminal Tangible dimension

Items	Statements
AT1	Cleanliness of the arrival airport toilets
AT2	Number of shops in arrival airport
AT3	Availability of different transportation modes at the airport exit
AT4	Size of the arrival airport
AT5	Effective conditioned areas for smokers in arrival airport
AT6	Good Signage of arrival airport
AT7	Availability of trolleys in arrival airport
AT8	Reliability of security control system in arrival airport
AT9	Employees' uniform are visually appealing in arrival airport
AT10	Comfort of baggage claim area
AT11	Availability of wide range of newspaper selection in arrival airport
AT12	Arrival airport is clean
AT13	Arrival airport is modern looking
AT14	Quality of air conditioning in the arrival airport

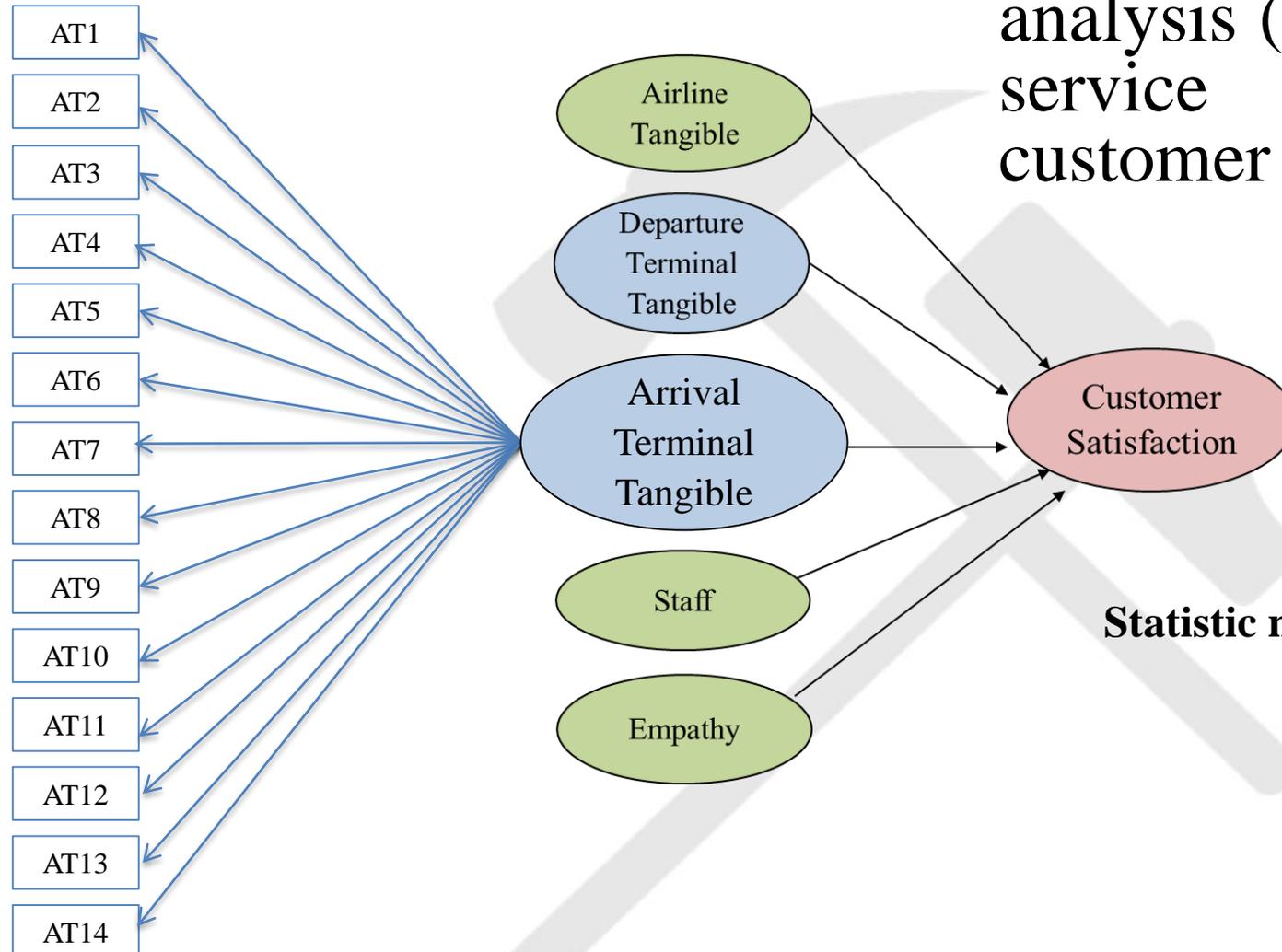
Satisfaction indicators

Items	Statements
SAT1	My satisfaction with the airlines has increased
SAT2	My impression of this airline has improved
SAT3	I now have a more positive attitude towards the airline company
SAT4	Availability of low price ticket offerings
SAT5	Consistency of ticket prices with given service
SAT6	Image of airline company
SAT7	The paid fare is acceptable

loyalty indicators

Items	Statements
RI1	I consider this airline company my first option
WOW1	I say positive things about this airline company to other people
WOW2	I recommend this airline company to someone who seeks my advice
WOW3	I encourage my relatives and friends to fly with this airline company

Confirmatory factor analysis (CFA) model for service quality and customer satisfaction.



Statistic multivariate technique

Measurement Model



C=MP²
 CALIDAD = Modernización,
 Pertinencia y Participación

UN
 UNIVERSIDAD NACIONAL DE COLOMBIA
 SEDE MEDELLÍN
 FACULTAD DE MINAS

	Component					
	1	2	3	4	5	6
AIR1					.553	
AIR2					.692	
AIR3					.469	
AIR4					.629	
AIR5					.560	
AIR6					.623	
AIR7					.581	
DT1		.707				
DT2		.784				
DT3		.718				
DT4		.808				
DT5		.529				
DT6		.798				
DT7		.735				
DT8		.764				
DT9		.749				
DT10		.753				
DT11		.568				
DT12		.796				
DT13		.864				
DT14		.794				
AT1	.754					
AT2	.825					
AT3	.807					
AT4	.869					
AT5	.662					
AT6	.854					
AT7	.758					
AT8	.795					
AT9	.786					
AT10	.805					
AT11	.624					
AT12	.815					
AT13	.861					
AT14	.792					

	Component					
	1	2	3	4	5	6
PER1			.786			
PER2			.831			
PER3			.806			
PER4			.820			
PER5			.842			
PER6			.778			
PER7			.645			
PER8			.630			
EMP1						
EMP2						.816
EMP3						.723
EMP4						.496
EMP5						.798
EMP6						
EMP7						
SAT1				.758		
SAT2				.754		
SAT3				.780		
SAT4				.699		
SAT5				.782		
SAT6				.673		
SAT7				.756		
SAT8				.488		

- SPSS
- Method of principal component extraction with VARIMAX rotation.
- Six dimensions were identified.
- Five items with factor loading less than 0.5 were excluded from the scale. Hair et al., 2009

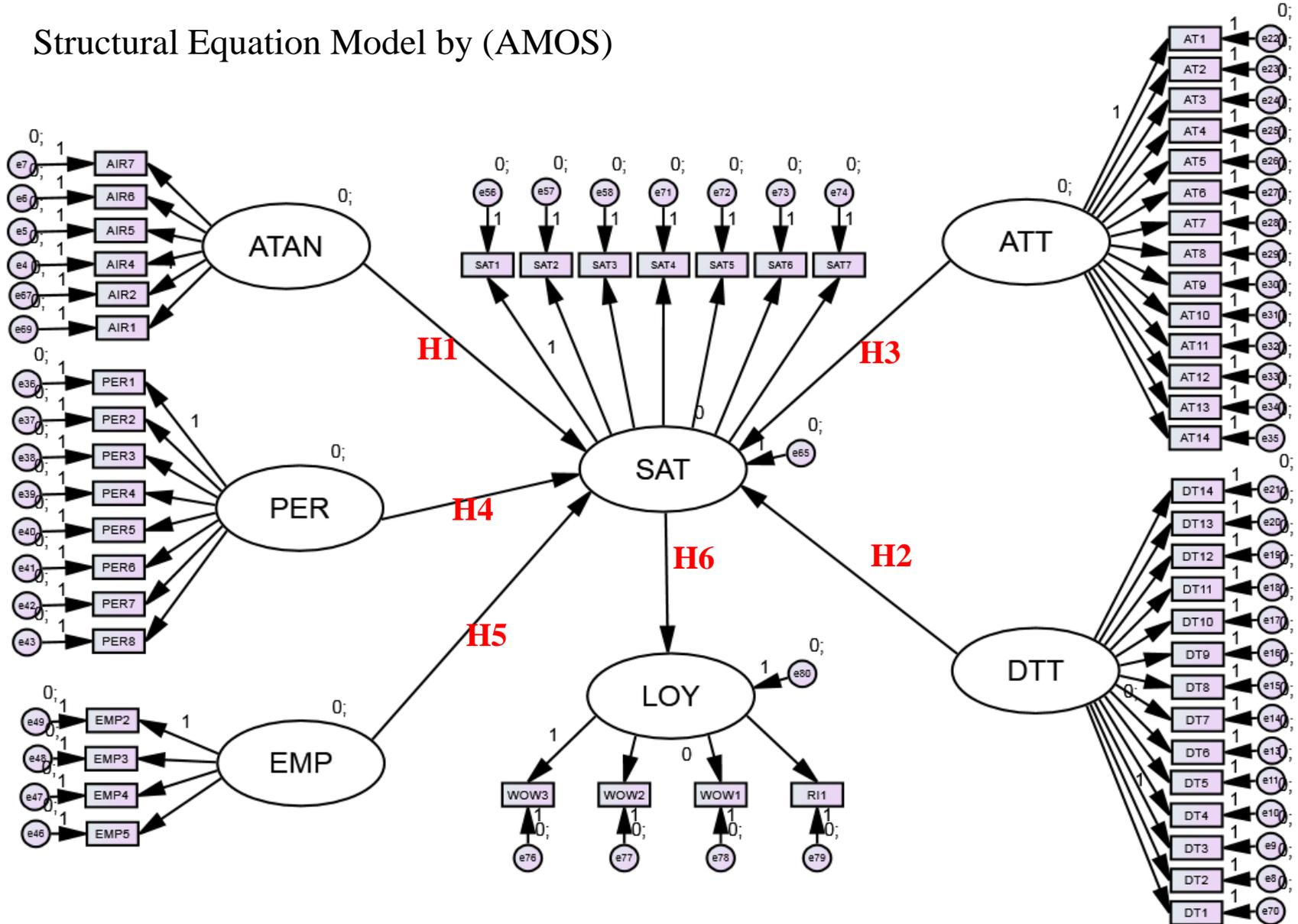
Statements	Cronbach's alpha	Variance explained (%)
Factor 1: Arrival Terminal Tangible	0.963	17.01
Factor 2. Departure Terminal Tangible	0.949	15.29
Factor 3. Staff	0.945	12.43
Factor 4. Satisfaction	0.935	10.03
Factor 5. Airline Tangible	0.895	5.9
Factor 6. Empathy	0.806	5.43

The Kaiser-Meyer-Olkin (KMO) measurement was 0.939. It confirms the sampling adequacy. The sample size is considered to be suit for factor analysis because it is above 0.9. (Kaiser, 1974)

The Cronbach's alpha is used to assess internal consistency. Dimension ranging from 0.806 (Empathy) to 0.963 (Arrival Terminal). Values above 0.80 generally indicate a good level of reliability (Hair et al. 1998)



Structural Equation Model by (AMOS)



Descriptive statistics and correlation matrix

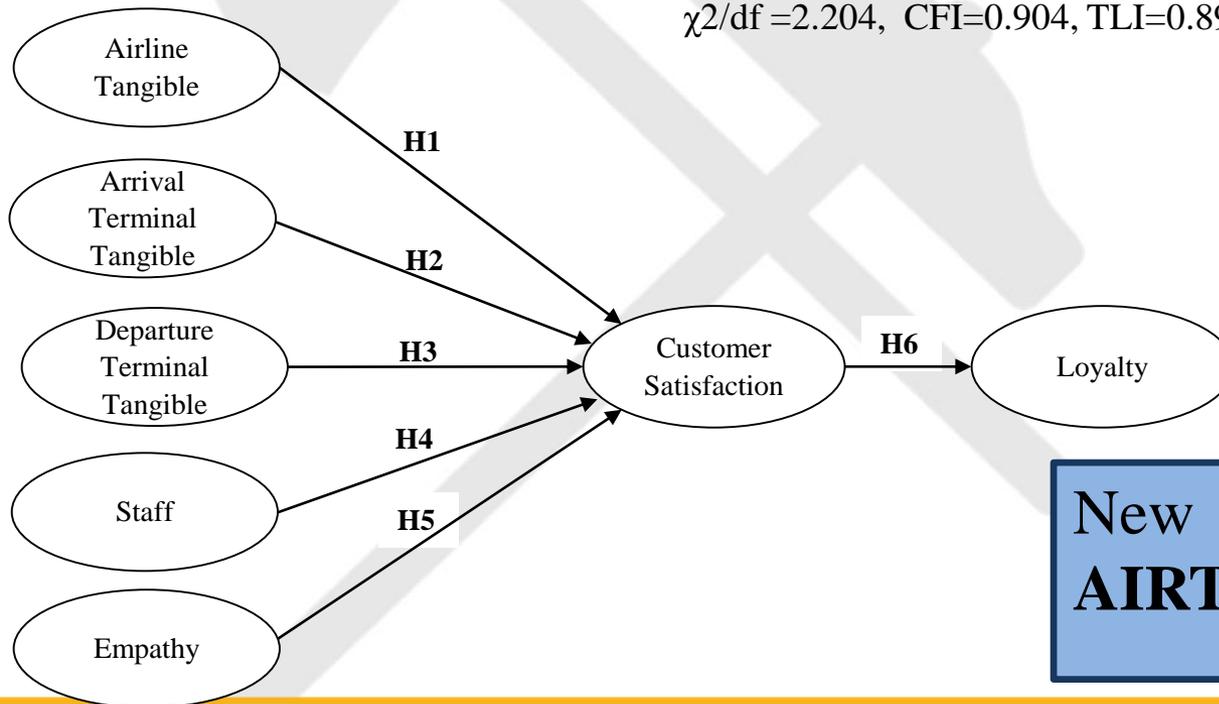
	Airline Tangible	Departure Terminal	Arrival Terminal	Staff	Empathy	Satisfaction	Loyalty
Airline Tangible	1						
Departure Terminal	0.485**	1					
Arrival Terminal	0.419**	0.262**	1				
Staff	0.680**	0.373**	0.444**	1			
Empathy	0.361**	0.302**	0.321**	0.430**	1		
Satisfaction	0.554**	0.424**	0.452**	0.598**	0.470**	1	
Loyalty	0.521**	0.297**	0.348**	0.539**	0.364**	0.792**	1
Descriptive statistics							
Mean	5.692	4.896	4.839	5.684	3.624	4.988	5.015
Standard deviation	1.067	1.304	1.430	1.140	1.603	1.485	1.588
** Correlation is significant at 0.01 level.							

Structural Model



Hypothesis	Endogenous variable	Exogenous variable	Standardized estimate	Estimate	SE	t	P	Result
H1	Satisfaction	← Airline Tangible	0.146	0.169	0.061	2.763	0.006	Supported
H2	Satisfaction	← Departure Terminal	0.152	0.125	0.043	2.886	0.004	Supported
H3	Satisfaction	← Arrival Terminal	0.161	0.123	0.039	3.109	0.002	Supported
H4	Satisfaction	← Staff	0.459	0.502	0.062	8.148	< 0.001	Supported
H5	Satisfaction	← Empathy	0.255	0.198	0.045	4.438	< 0.001	Supported
H6	Loyalty	← Satisfaction	0.833	0.93	0.058	15.933	< 0.001	Supported

$\chi^2/df = 2.204$, CFI=0.904, TLI=0.895, RMSEA=0.062



**New instrument:
AIRTERQUAL**

We propose a new index applied in the air transportation market. It was called customer satisfaction index in the air transportation (CSI-AT). Based on American Customer Satisfaction Index (ACSI). (Fornell, Johnson and Anderson, 1996)

$$ACSI = \frac{E[\xi] - \text{Min}[\xi]}{\text{Max}[\xi] - \text{Min}[\xi]} * 100 \quad CSI_AT = \frac{\sum_{i=1}^7 w_i Me_i - \sum_{i=1}^7 w_i}{6 \sum_{i=1}^7 w_i} * 100$$

Where ξ is the latent variable for customer satisfaction, and $E[.]$, $\text{Min}[.]$ and $\text{Max}[.]$ denote the expected, the minimum and the maximum value of the variable respectively

$$\text{Min}[\xi] = \sum_{i=1}^n w_i \text{Min}[x_i]$$

$$\text{Max}[\xi] = \sum_{i=1}^n w_i \text{Max}[x_i]$$

In ACSI there are three indicators for customer satisfaction, which range from 1 to 10.

$$ACSI = \frac{\sum_{i=1}^3 w_i x_i - \sum_{i=1}^3 w_i}{9 \sum_{i=1}^3 w_i} * 100$$

$$CSI_AT = \frac{\sum_{i=1}^7 w_i Me_i - \sum_{i=1}^7 w_i}{6 \sum_{i=1}^7 w_i} * 100$$

The CSI-AT score for air transportation industry is found 73.5
(for 0-100 scale)

This research will contribute identifying service quality dimensions related to airline and airport market in order to find overall passengers' satisfaction level. AIRTEQUAL Scale.

In this study, we proposed a customer satisfaction robust index for air transportation services (CSI-AT) and we estimated the index using the proposed model.

This research may help airlines and airports management to identify their performance deficiencies and defining the way of enhancing their service quality in order to better satisfy the customer and increase customer loyalty.

thank you for your attention

