Quality in bank service encounters: Assessing the equivalence of customers' and front-line employees' perceptions

Chrysi Alexiadou
Department of Business Administration, University of Macedonia, 156 Egnatias Str., PO Box 1591, 54006, Thessaloniki, Greece

Nikolaos Stylos (*)
The University of Wolverhampton Business School, Arthur Storer Building, Nursery Street, Wolverhampton WV1 1AD, England, United Kingdom

Andreas Andronikidis
Department of Business Administration, University of Macedonia, 156 Egnatias Str., PO Box 1591, 54006, Thessaloniki, Greece

Victoria Bellou
Department of Economic Studies, University of Thessaly, 43 Korai Str., 38333, Volos, Greece

Chris A. Vassiliadis
Department of Business Administration, University of Macedonia, 156 Egnatias Str., PO Box 1591, 54006, Thessaloniki, Greece

(*) Corresponding author

Purpose: The paper discusses the need to evaluate perception-based quality in service encounters. It sets out to diagnose potential mismatches in how customers and front-line employees perceive quality in high involvement service settings, based on the premise that any initiatives towards quality enhancement in service encounters is advisable only when employees and customers evaluate quality utilizing common perceptual structures.

Design/methodology/approach: The study utilizes invariance analysis. The survey involved 165 bank branches and 1522 respondents (463 front-line employees and 1059 customers) and operationalized the same set of questions for both groups of participants. Multisample Confirmatory Factor Analysis tested a series of measurement models.

Findings: Results revealed equivalence for tangibles, responsiveness, and assurance but also mismatches between customers and front-line employees perceptions of reliability and empathy.

Practical implications: Findings add to current knowledge of how both groups of participants evaluate quality in service encounters and are discussed with reference to managerial consequences for perception-based quality mismatches.

Originality/value: So far only a few studies have simultaneously examined front-line employees' and customers' perceptions of service quality in service encounters. Unlike previous research designs, this study addresses the critical aspect of potential mismatches in how customers and employees perceive service quality, and presents a methodological procedure to detect them.

Keywords: service encounters; perceptions; invariance analysis; service quality

Article Classification: Research paper

1. Introduction

Bank services are an important part of the services industry (Mishkin, 2007). In line with the integrated global banking environment, many regulatory, structural and technological changes have taken place within the global banking industry (Angur *et al.*, 1999; Ladhari, 2009). Banks are expanding across borders, offering a diverse portfolio of competitive services and restructuring their services in order to meet the changing needs of customers (Arasli *et al.*, 2005). Over the years, service quality has been increasingly recognized as a key strategic value for service organizations (i.e. Agus et *al.*, 2007; Arasli *et al.*, 2005; Gounaris *et al,* 2003; Guo *et al*, 2008; Kersten and Koch, 2010; Kumar *et al.*, 2009; Kuo *et al.*, 2009; Kyoon Yoo and Ah Park, 2007; Lin and Wang, 2006; Seth *et al.*, 2005). In this vein, service managers realize that to successfully leverage service quality as a competitive edge, actions should not be limited to developing and monitoring objective measures of the technical aspects of quality (Brooks & Hestnes, 2010; González *et al.*, 2008) but should also focus on correctly assessing how customers perceive service quality (Abdullah *et al.*, 2011; Lassar *et al.*, 2000; Rha, 2012; Zeithaml, 1988). As Chase and Dasu (2001, p. 84) postulate, “Ultimately, only one thing matters in a service encounter—the customer’s perception of what occurred”.

Nevertheless, service encounters are dyadic in nature (Solomon *et al.*, 1985); front-line employees are particularly important to the service experience of the customer. Moreover, the existing research reports a positive relationship between the perceptions of front-line employees and customers regarding service quality (Burke *et al.*, 1996; Schneider *et al.*, 1998; Schneider *et al.*, 1996; Schneider and Bowen, 1995), suggesting that employee surveys of service quality are valid reflections of customers’ relative perceptions (Schneider et al., 1996).

Interestingly, up until now, most research in service quality prioritized understanding either service providers’ or customers’ perspectives while only a few studies attempted to delineate it in a service encounter context (for example see Chow-Chua and Komaran, 2002; Dedeke, 2003; Peiró *et al.*, 2005; Svensson, 2006; Svensson, 2002). These studies operationalize applications that examine perceptual differences on mean score ratings from employees and customers, taking for granted that these parts of the service encounter share a common perceptual pattern of service quality. Yet, perceptual mismatches may exist.

Taken together, this study seeks to investigate potential perceptual invariance configuration of perceived service quality for both employees and customers in bank encounters. In particular, we examine equivalency of factorial structure for the

SERVPERF measurement model with respect to the relationships among latent variables (i.e. perceived quality and five dimensions), as well as between latent and observed variables (i.e. five dimensions and their twenty-two measured items). In doing so, we utilize Multisample Confirmatory Factor Analysis (MCFA) in first and second-order structures to examine and evaluate service quality within bank encounters as perceived by first-line employees and customers not only at an aggregate level but also at an item/attribute level. As researchers note, conducting validity assessments of the instruments used to measure attitudinal quality are critical in order to reach reliable conclusions (i.e. Carman, 1990; De Chernatony *et al.*, 2004).

From a theoretical perspective, this study builds upon the work of Schneider and Bowen (1985), Bitner *et al.* (1994), as well as Brady and Cronin (2001) to extend current knowledge of how the two groups involved in service encounters evaluate distinct facets of quality in a shared service experience. An understanding of potential matches and mismatches in front-line employee and customer perceptions would offer a more holistic view of the service quality produced. From a practical perspective, evidence suggests that service quality mismatches in service encounters may affect service production, delivery, and consumption, and in turn the customers' overall service experience (Weiermair, 2000). Thus, the findings of this paper could serve as a starting point for evaluating perceived service quality in bank encounters, helping bank managers recognize the aspects of quality that are cornerstones for both internal and external customers.

2. Literature Review

2.1 Service encounters

Services are produced, distributed, and consumed in an interactive process between the service provider and the service receiver (Svensson, 2006, 2004), stressing the need to understand service encounters. Service encounters involve both human and non-human interactions (Meuter *et al.*, 2000), encompassing all aspects of the service firm with which the customer may interact, including personnel, physical facilities and other tangible elements, during a given period of time (Bitner *et al.*, 1990; Ghobadian et *al.*, 1994; Jun and Cai, 2001).

Previous research in the service sector has established a positive correlation between the perceptions of service quality of front-line employees and customers (Hee Yoon *et al.*, 2004; Jeon and Choi, 2012; Salanova *et al.*, 2005; Tax *et al.*, 1998; Wu *et al.*, 2015). In this vein, evidence suggests that the way that employees experience their work environment is reflected in customers' perceptions of service quality (Bitner et al. 1994; Maxham III *et al.*, 2008; Schneider and Bowen, 1985). As Schneider and Bowen (1993, p. 39) note, these similar perception are "a consequence of the psychological and physical closeness that exists between employees and customers in service encounters", arguing that "the key to managing the customer's experience of service quality is to manage employees' experiences within their own organization".

Other than Schneider and Bowen (1993; 1985), who conducted their studies among front-line bank employees and customers, other researchers have offered similar evidence for the banking sector. For example, Gounaris and Boukis (2013) concluded that strong similarities in the perceptions of the groups involved in the service encounter exert a positive influence on customers' repurchase intentions. Similarly, research indicates that when employees understand the mindset of customers, several benefits can be realized; employees are more likely to display greater engagement, customers receive better services, and the organization has increased performance (George and Hegde, 2004; Myrden and Kelloway, 2015; Papasolomou-Doukakis, 2002; Plakoyiannaki *et al.*, 2008; Ulrich, 1991).

Nevertheless, as Chandon *et al.* (1997) and Rhee and Rha (2009) note, front-line employees often fail to accurately assess customer perceptions of specific quality attributes. Investigating studies on employee-customer service perceptions in the banking sector, Johnson (1996) and Yavas (2006) concluded that those involved in service encounters' do not place the same value on service quality dimensions. Therefore, gaining an in depth understanding of how both parties perceive service quality necessitates focusing on how each perceived distinct facets of service quality (Huang, 2008; Jougleux, 2006; Najjar and Bishu 2006; Rohini and Mahadevappa, 2006). As a consequence of the above contrasting findings, this study sets out to check the following hypothesis:

H_1: Front-line employees and customers share perceptions of service quality.

2.2 Measuring Service Quality

Research incorporates numerous instruments to measure service quality. Other than SERVQUAL (Parasuraman *et al.*, 1988; 1985) and SERVPERF (Cronin and Taylor, 1992) which are the most widely accepted (Al Khattab and Aldehayyat, 2011; Vera and Trujillo, 2013), various industry specific alternatives have emerged. In the banking sector, these are the BANKSERV of Avkiran (1994), the SYSTRA-SQ of Aldlaigan and Buttle (2002), the BSQ of Bahia and Nantel (2002), the CARTER model of Othman and Owen (2001) and finally BANKZOT (Nadiri *et al.*, 2009).

In line with those scholars who argue that the measurement of expectations does not necessarily offer appropriate information when estimating service quality (i.e. Ali et *al*., 2015; Chiou and Droge, 2006; Cronin and Taylor, 1992; Dagger *et al.*, 2007), BANKSERV, BANKZOT, and SYSTRA-SQ were not considered appropriate choices. Concerning the rest of the industry specific measurement scales, to a greater or lesser extent they both have reliability and validity issues, as the CARTER model has been designed only for the Islamic banking industry while BSQ has been entirely based upon opinions of experts and has a rather unstable factorial structure (Bahia and Nantel, 2000). Adjusted to the particularities of the service context of a bank, the aforementioned instruments relate - more or less- to the items and the key service quality dimensions (tangibles, reliability, responsiveness, assurance, and empathy) comprising SERVQUAL and SERVPERF. Taken together, and given that SERVPERF has been reported to produce higher adjusted R^2 values compared to SERVQUAL's gap scores (Kettinger and Lee, 2005), and also remains a standard and compact measure that has been quite recently used in the banking industry (Culiberg and Rojsek, 2010), we chose it as the measurement tool to test our hypothesis. As such, adjusting H1 in the SEVPERF instrument, we aim to test whether:

H_{1a}: There is equivalence in perception of service quality dimensions designated by SERVPERF between front line employees and customers.

H_{1b}: There is equivalence in perception of distinct aspects of service quality (indicators) designated by SERVPERF between front line employees and customers.

3. Method

The study incorporates double source data to measure the quality of the service encounter. The same questionnaire was used for both customers and front-line employees, allowing a comparative analysis of their responses. The research objectives are examined through MCFA at both first and second order measurement models. Specifically, invariance analysis explored factorial equivalence both at factor (dimensions/latent variables) and indicator levels (items/observed variables). All necessary steps taken are presented below.

3.1 Instrument, Sampling and Data Collection Procedures

As aforementioned, the study utilized SERVPERF. The methodological steps to enhance content validity and reliability of the research procedure are presented on Table 1. First, the questionnaire was back translated from English to Greek. After the measurement instrument was initially constructed, it was pilot tested on bank front-line employees and customers. The main sampling procedure was conducted based on the perceptions of 481 front-line employees and 1308 bank customers. Customers were approached outside bank branches after they had received service and every third customer exiting a bank branch was systematically sampled. Questionnaires were coded to reflect only the location of the bank branch and respondents were given the option to drop completed questionnaires in a box or hand them back to the researcher. Field research was carried out at 165 of the 465 available bank branches located in the Thessaloniki greater metropolitan area. The 165 branches included in the research scheme were those that positively replied to our invitation to participate in the research. As a result, 1522 usable questionnaires emerged in total from the two parallel sampling procedures aiming at receiving opinions from customers and employees, meaning that none of the questionnaires were discarded (see Table 1).

Regarding sample size, Hair *et al.* (2010) suggest that models with seven or fewer constructs (latent variables/service quality dimensions) and measured items (observed variables/service quality attributes) with communalities of critical statistical scores below 0.45 indicate a minimum sample size of 300. According to Golob (2003), the initial evaluations of sample size for applying the usual Maximum-Likelihood (ML) technique of structural equation modeling requires that one should have collected as many responses as 15 times the number of observed variables. The questionnaire that was put in use in this study has 22 measured items, indicating that a sample size of minimum 330 cases would be necessary to apply the ML technique successfully. Since our intention was to collect responses from the two distinct groups of participants involved in bank encounters, the minimum sample size should separately apply to both groups. Consequently, the responses collected from bank customers and employees (1059 and 463 respectively) are considered more than satisfactory for conducting our analysis.

MCFA was performed using AMOS 16 software on the 22-item SERVPERF model. The maximum likelihood estimation (ML) was employed in analysis with a sampling ratio of 10:1 or even better 15:1 to the number of observed variables (Hair et al., 2010). The sample size condition was met in this study with an overall ratio 1522:22 or 69.18:1. Moreover, group-ratios were 48.13:1 (1059:22) and 21.05:1 (463:22) for customers and employees, respectively. Consequently, sample size requirements were met.

Table 1 Research Procedure: methodological steps

Research stage	**Research action**
Literature Review →	• Research on service perceptions measurement scale items • SERVPERF dimensions and measurement items
Initial Questionnaire Development →	Results from literature review and measurement items were translated in Greek
Pilot Study →	Questionnaire was tested on 40 undergraduate business administration students having the role of Bank customers, while it was also tested on 6 graduate executive MBA students working in banking sector

Final Questionnaire Development →	Comments and changes resulted from pilot study were taken into account
Data Collection →	1522 usable self-administered questionnaires (1059 customers and 463 employees) at 165 out of 465 bank branches of Thessaloniki greater metropolitan area (both groups randomly selected)
Data Analysis →	• Tests for response bias • Missing Values Analysis (MVA) using SPSS • Multisample Confirmatory Factor Analysis (MCFA) between groups (invariance analysis) • Multi-group moderation on second-order (SERVPERF) model

3.2 Data analysis

The data analysis procedures are presented step-by-step on Table 2.

Table 2 Major steps in data analysis

Steps	**Purpose**
Data Handling	• Data input and coding • Missing Values Analysis with Expectation-Maximization Technique (EM)
Descriptive Analysis – Scale Reliability and Validity	• Characteristics of sample • Overall data quality
Measurement Models Testing	Multisample Confirmatory Factor Analysis (MCFA) *First-order measurement model* • Configural invariance • Metric Invariance • Construct reliability and validity measures *Second-order measurement model* • Configural invariance • Metric Invariance • Scalar Invariance
Pairwise Comparisons	• Critical Ratios Differences • Goodness-of-Fit-indices • Standardized regression weights (beta coefficients)

Model Explanatory Value	• Total coefficients of determination TCD (R^2)

The study utilized a post-data collection technique to examine potential response bias (Cohen, 1988). Results indicated non-statistically significant differences at 0.05 level of significance, suggesting that response styles have not biased the data.

Little’s MCAR test (Little, 1988) for missing values analysis (MVA) has revealed that any data in our analysis are missing completely at random, since corresponding H_0 cannot be rejected (χ^2=135.499, *df*=151, Sig.=0.812)(Garson, 2012; Olinsky *et al.*, 2003).

MCFA has been applied at first and second-order factor models (Malhotra, 2004; Hair *et al.*, 2010). The criterion for implementing second-order factor analysis is the formation of SERVPERF model theory itself. Previous research suggests that three stages of invariance analyses are most appropriate for testing measurement models: configural, metric and scalar invariance (Horn *et al.*, 1983; Milfont and Fischer, 2010; Rutkowski and Svetina, 2014; van de Schoot *et al.*, 2012).

The first-order measurement model has undergone two of the measurement invariance tests: configural and metric (Hair et al., 2010). Establishing metric invariance for the first-order measurement model enables testing for full measurement invariance of the second-order measurement model, i.e. the SERVPERF model. In this case the second-order model has been tested for full and then partial measurement invariance between customers and employees. Finally, to ratify the results of the step-wise χ^2 invariance tests procedure, the ‘Critical Ratios for Differences’ technique supported by AMOS software has been employed, thus providing an aggregate view of the statistically equivalent, as well as different latent and observed items included in the SERVPERF instrument.

Concerning reliability and validity, a series of diagnostic measures were calculated in order to ensure the good standing of the summated scales. Furthermore, it was important to evaluate scale reliability with composite reliability measures, as well as convergent and discriminant validity. The aim of re-assessing those measures is to ensure dimensionality of the model representing proposed measurement theory. Next, some technical issues concerning model fit statistics and invariance analyses are explained. In this study, the following fit statistics were applied (Hair *et al.*, 2010; Reisinger and Mavondo, 2007; Vijayakumar, 2007): Normed chi-square (χ^2/df), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Parsimony Normed Fit Index (PNFI) and Standardized Root Mean Residual (SRMR) for both first and second-order factor models, as indicated on Table 3.

Table 3 Tests for Data Analysis

Criteria for reliability and validity of multiple-item scales	Coefficients	Criteria
	Cronbach's alpha (Internal Consistency)	≥ 0.70 (George, 2003) ≥ 0.60 (Robinson et al., 1991)
	Composite Reliability (CR)	≥ 0.70 ÷ 0.60 (Hair et al., 2010) ≥ 0.60 (Bagozzi and Kimmel, 1995)
Model fit indices and corresponding criteria	Model Fit Indices	Criteria
	Normed Chi-Square	χ^2/ df<5
	Root Mean Square Error of Approximation	0.05< RMSEA <0.08 (acceptable fit) RMSEA <0.05 (good fit) RMSEA <0.07 (good fit) (CFI>0.90)

	Comparative Fit Index	CFI >0.90 (acceptable fit) CFI >0.95 (good fit)
	Parsimony Normed Fit Index	PNFI>0.60 (acceptable fit)
	Tucker-Lewis Index	TLI>0.90 (good fit)
	Standardized Root Mean Residual	SRMR<0.08 (CFI>0.92)
	Indices for Nested Models Comparisons	Criteria for Invariance
Model fit indices and corresponding criteria for invariance check	Chi-square difference statistic per $\Delta df = 1$	$\Delta\chi^2<3.84$ for $p<0.05$ or $\Delta\chi^2<6.63$ for $p<0.01$

4. Results

4.1 Reliability and Validity

Cronbach's alpha coefficients calculated for SERVPERF dimensions indicate satisfying levels of reliability for the two sub-populations of bank services encounters (Table 4). Factor loadings vary between 0.518 and 0.944, implying high levels of convergent validity for each group (Hair at al., 2010).

Table 4 Means, Standard deviations, and internal consistency of the scales

Construct	Item	Mean (SD)		Cronbach's α	
		Cust.	Empl.	Cust.	Empl.
1. TANGIBLES				0.813	0.711
	Up-to-date equipment and instrument facilities of your bank (Tan1)	5.48 (1.24)	5.58 (1.56)		
	Bank's physical facilities are visually appealing (Tan2)	5.20 (1.32)	5.05 (1.33)		
	Employees of your bank are well dressed and appear neat (Tan3)	5.68 (1.26)	5.61 (1.16)		
	The appearance of the				

	physical facilities of the bank are in keeping with the type of services provided (Tan4)	5.10 (1.36)	5.14 (1.43)		
2. RELIABILITY				0.770	0.890
	If Bank has promised to do something by a certain time, it will do so (Rel1)	5.27 (1.37)	5.33 (1.14)		
	Bank is dependable (Rel2)	5.75 (1.24)	5.91 (1.07)		
	Bank provides its services at the time it promises to do so (Rel3)	5.39 (1.27)	5.15 (1.27)		
	Bank keeps its records accurately (Rel4)	5.56 (1.29)	5.64 (1.16)		
	Bank performs the service right at first time (Rel5)	4.61 (1.71)	5.65 (1.13)		
3. ASSURANCE				0.812	0.895
	When customers have problems, Bank is sympathetic and reassuring (Ass1)	4.89 (1.50)	5.51 (1.23)		
	Clients can trust employees of their Bank (Ass2)	5.29 (1.42)	5.77 (1.11)		
	Customers feel safe in transactions with their Bank (Ass3)	5.45 (1.37)	5.59 (1.20)		
	Bank employees are polite (Ass4)	5.80 (1.27)	5.78 (1.09)		
4. RESPONSIVENESS				0.747	0.857
	Bank provides prompt service to the customers (Res1)	4.79 (1.74)	5.39 (1.22)		
	The bank employees are always willing to help customers (Res2)	5.02 (1.74)	5.17 (1.26)		
	Banker replies in any query of the customers (Res3)	4.72 (1.72)	5.15 (1.26)		
	The banks tell the customer exactly when the service will be performed (Res4)	4.70 (1.70)	5.03 (1.36)		
5. EMPATHY				0.751	0.865
	Employees get adequate				

support from Bank to do their jobs well (Emp1)	5.08 (1.26)	5.38 (1.25)
Bankers give individual attention to the customers (Emp2)	4.72 (1.74)	4.79 (1.49)
Bankers try to know what customers' needs are (Emp3)	4.26 (1.73)	5.21 (1.22)
The bank has customers' best interests at heart (Emp4)	4.09 (1.78)	4.70 (1.45)
The bank has operating hours convenient to all their customers (Emp5)	4.07 (1.87)	5.20 (1.51)

Note: "Cust." stands for Customers and "Empl." stands for Employees.

Again, at the confirmatory factor analysis stage, the total sample reflects the two main groups involved in bank encounters: customers and front-line employees. Tables 5 and 6 include reliability, convergent and discriminant validity measures. Results show that none of reported rules are violated, thus supporting the measurement model structure depicted in Figure 1.

Table 5 Construct Reliability and Validity measures of first-order measurement model for bank customers

	CR	AVE	MSV	ASV	Reliability	Tangibles	Responsiveness	Assurance	Empathy
Reliability	0.808	0.974	0.556	0.475	0.987				
Tangibles	0.755	0.521	0.436	0.398	0.661	0.722			
Responsiveness	0.728	0.790	0.644	0.512	0.590	0.456	0.889		
Assurance	0.744	0.722	0.675	0.421	0.689	0.746	0.705	0.850	
Empathy	0.757	0.746	0.720	0.464	0.617	0.553	0.559	0.649	0.864

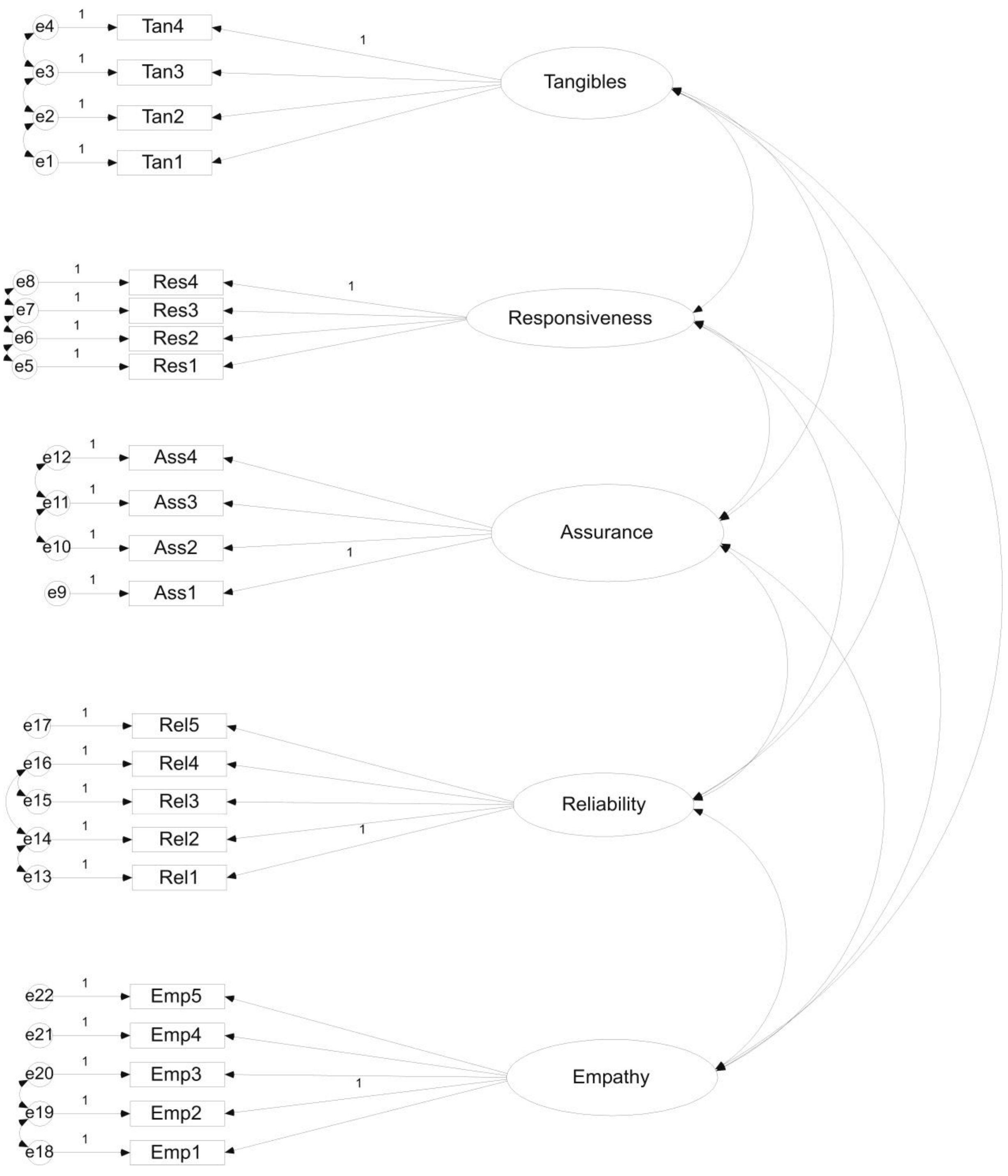
Table 6 Construct Reliability and Validity measures of first-order measurement model for bank employees

	CR	AVE	MSV	ASV	Reliability	Tangibles	Responsiveness	Assurance	Empathy
Reliability	0.885	0.893	0.720	0.608	0.880				
Tangibles	0.738	0.531	0.454	0.453	0.729	0.773			
Responsiveness	0.865	0.785	0.757	0.618	0.856	0.622	0.886		
Assurance	0.874	0.806	0.803	0.637	0.845	0.661	0.872	0.898	
Empathy	0.881	0.772	0.751	0.607	0.851	0.678	0.861	0.847	0.879

4.2 First-order measurement model

After the reliability and validity of the first-order measurement model have been confirmed, the assessment of measurement model fit to the data follows. MCFA was employed in order to obtain a measurement model which expresses both customers' and employees' perceptions. First, the proposed factor structure was checked for unidimensionality. Observed variables should have high loadings (>.50) on the latent variables and must be significant (Critical Ratio = C.R. = z-value > 1.96) and at the same time, the overall fit of the model should be adequate (Janssens et al. 2008). Following these criteria, all variables were retained (Figure 1).

Sub-output "regression weights", representing factor loadings, denote that variable "Emp1: Employees get adequate support from the Bank to do their jobs well" is significant for both customer and employee groups, but it has a lower loading (0.354<0.5) for customers than specified. Since, there is no other discrepancy, we choose to keep this variable in the model and deal with it at a next step, if needed.


e4
1
Tan4
1
e3
1
Tan3
e2
1
Tan2
e1
1
Tan1
Tangibles
e8
1
Res4
1
e7
1
Res3
e6
1
Res2
e5
1
Res1
Responsiveness
e12
1
Ass4
e11
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e22
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Emp5
e21
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Emp4
e20
1
Emp3
1
e19
1
Emp2
e18
1
Emp1
Empathy

Figure 1. First-order measurement model.

A configural invariance test was initially employed in order to examine whether the factor structure in MCFA achieved an adequate fit when the groups of participants were tested both individually and together. The separate models for customers and bank employees both exhibit acceptable levels of model fit, as does the combined

MCFA model. Table 7 summarizes the overall first-order measurement model fit evaluation. In total, the measurement model involves 22 observed variables, 27 unobserved variables including error terms and 106 parameters. Fit statistics show adequate fit of the combined model to the data with $\chi^2(df)$ = 1432.72 (348), $p<0.001$; CFI=0.924>0.90; RMSEA=0.055<0.08; TLI=0.908>0.90; PNFI=0.783>0.60 and SRMR=0.0680<0.08. Therefore, as far as configural invariance concerns, there is a good model fit with χ^2/df=4.117<5. Thus, we can proceed with metric invariance investigation. It involves constraining each matching loading to be equal across the groups of participants (Byrne, 2004; Hair *et al.*, 2010). The chi-square difference test in the two groups between the unconstrained and fully constrained measurement model has shown that they are invariant at model level, with $\Delta\chi^2$=29.7, 22 degrees of freedom and a resulting p-value=0.126>0.05 (see Table 8).

In conclusion, the additional between-group constraints did not significantly increase model fit, therefore the constructs are perceived and used in a similar manner exhibiting full metric invariance at first-order model level.

Table 7 Configural invariance fit indices for first-order and second-order measurement models

Fit Indices	**First-order measurement model**	**Second-order measurement model**	**Criteria**
χ^2 / df	4.117 for p<0.001	4.983 for p<0.001	<5.00
CFI	0.924	0.915	>0.90
PNFI	0.783	0.776	>0.60
TLI	0.908	0.900	>0.90
RMSEA	0.055	0.064	<0.08
SRMR	0.0680	0.0693	<0.08 (CFI>0.92)

Table 8 Chi-square test for metric invariance examination of the first-order and second-order measurement models

Measurement Model	Chi-square	*df*	p-value
1st-order unconstrained	1780.8	348	
1st-order fully constrained	1810.5	370	
Difference	**$\Delta\chi^2$=29.7**	**22**	**0.126>0.05**
2nd-order unconstrained	1793.8	360	
2nd-order fully constrained	1846.3	382	
Difference	**$\Delta\chi^2$=52.5**	**22**	**0.000<0.05**
2nd-order unconstrained	1793.8	360	
2nd-order partially constrained	1807.3	371	
Difference	**$\Delta\chi^2$=13.5**	**11**	**0.262>0.05**

4.3 Second-order measurement model

After securing metric invariance for the first-order measurement model, we proceed with testing a second-order factor structure. In this new structure, perceived quality serves as the causal construct of the five SERVPERF dimensions. This model has undergone three consecutive invariance analysis stages: configural, metric and scalar. The second-order measurement model is shown in Figure 2. It aims to examine possible differences in the implementation of the SERVPERF measurement model within bank service encounters. The implementation of the configural invariance test on the two-group setting (i.e. customers and employees) shows adequate fit of the proposed structural model to the data with $\chi^2(df)$ = 1793.88 (360), p<0.001; CFI=0.915>0.90; RMSEA=0.064<0.08; TLI=0.900; PNFI=0.776>0.60 and SRMR=0.0693<0.08 (Table 7). Application of the chi-square difference test between the unconstrained and fully constrained measurement model and for both groups of the encounter simultaneously results in a statistically significant difference $\Delta\chi^2$=52.5 with 22 degrees of freedom and a resulting p-value=0.000<0.05 (see Table 8).

Therefore, they are not fully invariant at a metric level, meaning that observed item differences will indicate group differences in the underlying latent construct. However, it is essential to establish at least partial metric invariance to carry on with the group differences. Constraining loadings for 3 first-order-construct paths (Tangibles, Responsiveness and Assurance) and 13 item loadings (Tan1, Tan2, Tan3, Res1, Res3, Ass1, Ass3, Rel1, Rel2, Rel3, Emp1, Emp2, Emp4) only, a non-significant difference $\Delta\chi^2$=13.5 with 11 degrees of freedom and p-value=0.262<0.05 have resulted (see Table 8). This partial invariance is acceptable since at least two indicators per construct have been found to be invariant (Hair *et al.*, 2010). Finally, the second-order model is tested for scalar invariance; Table 9 shows that $\Delta\chi^2$=180.8 (df=22) with p-value=0.000<0.05. Therefore, full scalar invariance is not supported. A subsequent attempt to establish partial scalar invariance followed by interchangeably constraining some but not all item and latent means, but it still did not work out. Hence, the items' means should not be used to make comparisons between the groups of participants.

Table 9 Chi-square test for scalar invariance examination of the second-order measurement model

Measurement Model	Chi-square	*df*	p-value
2nd-order unconstrained	7477.9	364	
2nd-order fully constrained	7658.7	385	
Difference	**$\Delta\chi^2$=180.8**	**21**	**0.000<0.05**

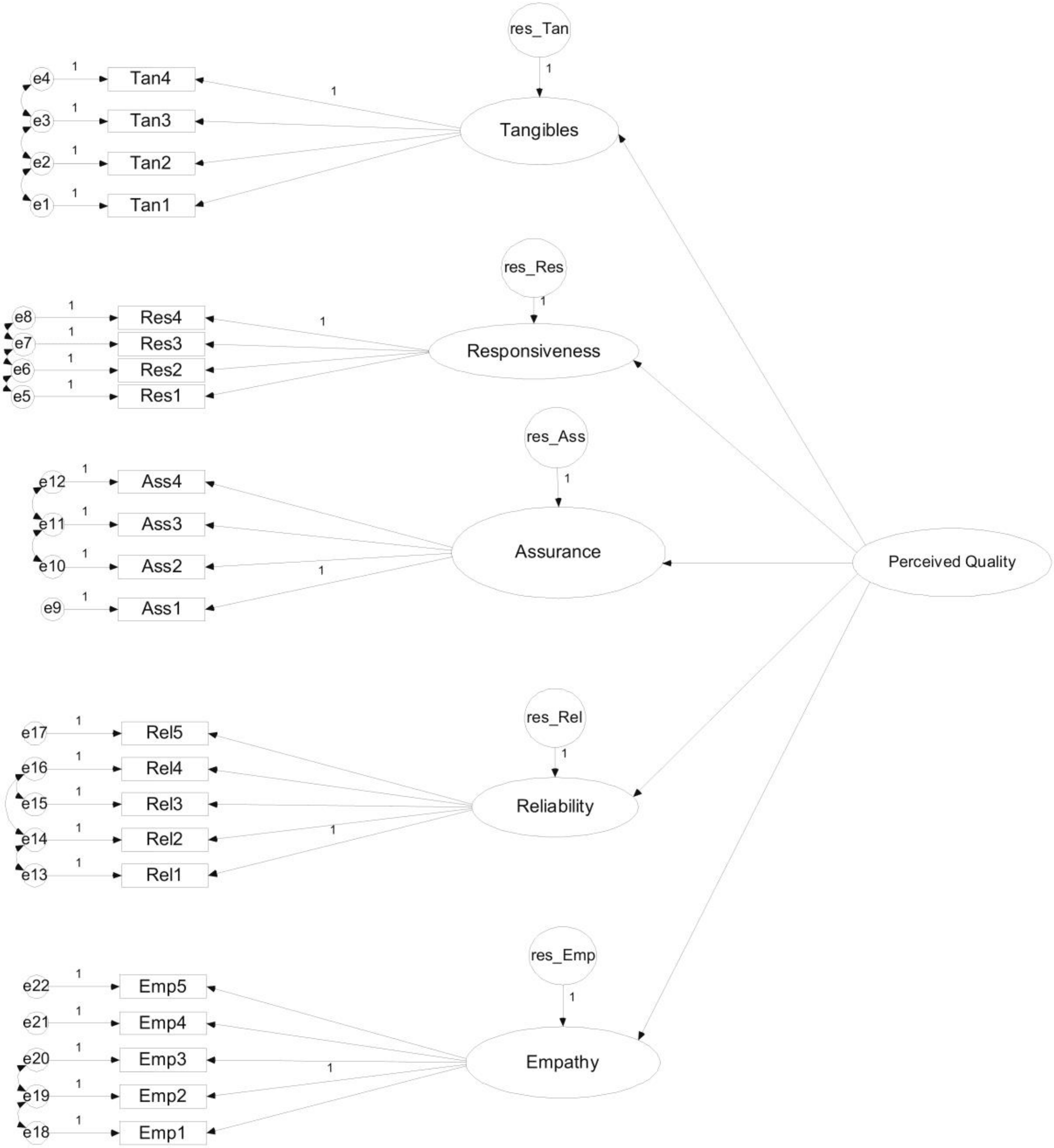
res_Tan
1
e4
e3
e2
e1
1
1
1
1
Tan4
Tan3
Tan2
Tan1
1
Tangibles
res_Res
1
e8
e7
e6
e5
1
1
1
1
Res4
Res3
Res2
Res1
1
Responsiveness
res_Ass
1
e12
e11
e10
e9
1
1
1
1
Ass4
Ass3
Ass2
Ass1
1
Assurance
Perceived Quality
res_Rel
1
e17
e16
e15
e14
e13
1
1
1
1
1
Rel5
Rel4
Rel3
Rel2
Rel1
1
Reliability
res_Emp
1
e22
e21
e20
e19
e18
1
1
1
1
1
Emp5
Emp4
Emp3
Emp2
Emp1
1
Empathy

Figure 2. Second-order measurement model.

Partial metric invariance was also checked using an alternative technique. Significant pairwise path coefficient differences in both indicators and latent variable levels were sought using the 'Critical Ratios for Differences' technique. The differences in perceptions between bank front-line employees and customers with respect to relations formed among each of the five factors of the SERVPERF model and perceived quality were examined at $\alpha=0.05$ or $\alpha=0.01$ significance levels. According to Table 10, the difference in the unstandardized factor loadings in the perceived quality - reliability relationship is statistically significant at $\alpha=0.01$ significance level; the difference concerning the relationship between perceived quality and empathy is found to be statistically significant at $\alpha=0.05$ significance level. The differences between the rest of the dimensions (assurance, responsiveness and tangibles) and perceived quality are non-significant at $\alpha=0.05$. Therefore, hypothesis H_1 that proposes equivalence in perception of the SERVPERF dimensions between bank personnel and customers is partially supported; three out of five relations between SERVPERF dimensions and the perceived quality construct have been found equivalent, while the remaining two indicate significant differences based on the value of the categorical moderator “group role” (i.e. service provider/prosumer).

Moreover, the observed variables of the measurement instrument were examined with respect to possible equivalency in the model paths involved across the bank employees’ and customers’ sub-populations. Table 10 clearly shows that in 13 instances there are non-significant differences in the perception of the 22 SERVPERF items between bank front-line personnel and customers; however, statistically significant differences at $\alpha=0.01$ or $\alpha=0.05$ level of significance have been indicated for one item from Tangibles and two items coming from each of the rest of SERVPERF dimensions (i.e. Responsiveness, Assurance, Reliability and Empathy). Therefore, hypothesis H_2 that assumes equivalence in perception of the SERVPERF indicators between bank front-line personnel and customers is partially supported.

Table 10 Critical Ratios Differences of regression weights (factor loadings) per group and denoted significant relationships (α=0.05 or 0.01)

To	**Paths**	**From**	**Customers**		**Employees**		**Difference**
			Unstandardized RW	p	Unstandardized RW	p	**z-score**
Tangibles	←	Perceived Quality	0.664	0.000	0.599	0.000	-0.850
Responsiveness	←	Perceived Quality	0.884	0.000	0.879	0.000	-0.065
Reliability	**←**	**Perceived Quality**	**0.933**	**0.000**	**0.769**	**0.000**	**-2.724*****
Empathy	**←**	**Perceived Quality**	**0.980**	**0.000**	**1.207**	**0.000**	**2.944*****
Assurance	←	Perceived Quality	1.039	0.000	1.102	0.000	1.004
Tan2	←	Tangibles	0.899	0.000	0.384	0.000	-1.84*
Tan3	←	Tangibles	0.839	0.000	0.976	0.000	1.411
Tan4	**←**	**Tangibles**	**0.956**	**0.000**	**1.262**	**0.000**	**2.236****
Res2	**←**	**Responsiveness**	**0.816**	**0.000**	**1.071**	**0.000**	**2.575****
Res3	←	Responsiveness	1.050	0.000	1.150	0.000	0.966
Res4	**←**	**Responsiveness**	**0.876**	**0.000**	**1.229**	**0.000**	**3.519*****
Ass2	**←**	**Assurance**	**0.913**	**0.000**	**0.745**	**0.000**	**-2.709*****
Ass3	←	Assurance	0.936	0.000	0.911	0.000	-0.412
Ass4	**←**	**Assurance**	**0.829**	**0.000**	**0.705**	**0.000**	**-2.146****
Rel2	←	Reliability	0.929	0.000	0.994	0.000	0.898
Rel3	←	Reliability	1.005	0.000	1.076	0.000	0.860
Rel4	**←**	**Reliability**	**0.829**	**0.000**	**1.115**	**0.000**	**3.713*****
Rel5	**←**	**Reliability**	**0.552**	**0.000**	**1.130**	**0.000**	**6.947*****
Emp5	**←**	**Empathy**	**0.728**	**0.000**	**0.911**	**0.000**	**2.702*****
Emp4	←	Empathy	0.677	0.000	0.796	0.000	1.91*
Emp3	**←**	**Empathy**	**0.633**	**0.000**	**0.867**	**0.000**	**3.954*****
Emp2	←	Empathy	0.472	0.000	0.507	0.000	0.470

Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10, RW = Regression weights

The explanatory value of the second-order measurement model with respect to the measured variables' variance is assessed by examining the squared multiple correlations and in specific the total coefficients of determination (TCD) R^2; they provide measures of how well the observed variables as a group render the latent constructs (Reisinger and Turner, 1999). According to Cohen (1988), in the behavioral sciences R^2 coefficients lying at 0.01, 0.09 and 0.25 levels indicate small, medium and large effects, respectively. As shown on Table 11, the proposed model is a powerful one for both groups of participants in bank encounters. The minimum score accounted for R^2 across groups was 0.298 and the maximum one was 0.996. Hence, the SERVPERF model explains the large amounts of variance that correspond to each dimensional construct (i.e. Assurance, Responsiveness and Tangibles).

Table 11 Squared multiple correlation values $R^2$of endogenous latent variables for customer and bank employees

Endogenous Latent Variables	**TCD Customers**	**TCD Employees**
Assurance	.996	.893
Responsiveness	.710	.961
Tangibles	.531	.298

In addition to making comparisons between customers and bank employees, implementation of MCFA allows examination of the relative importance of the first-order latent variables for the second-order factorial structure within each group. This is possible by comparing the standardized factor loadings (beta coefficients) of latent variables to each other as presented in Table 12. The relative importance of the three equivalently perceived dimensions follows the same order for both groups of respondents. Reporting in a descending order, assurance is considered more important for perceived quality by both customers and bank front-line employees compared to the rest of the dimensions. Similar conclusions are extracted for responsiveness as well as for tangibles. Therefore, there is consistency in the SERVPERF measurement instrument in terms of dimensions' relative importance.

Table 12 Beta coefficients for dimensions validated across bank encounters

Factor Loadings	**Customers**	**Employees**
	St. RW (factor loadings)	St. RW (factor loadings)
Assurance	.951	.997
Responsiveness	.853	.981
Tangibles	.747	.440

5. Discussion and Implications

Perceived quality of service is considered integral to bank service encounters – as such encounters are high involvement and constitute a key determinant of perceived value (i.e. Bitner, 1992; Prahalad and Ramaswamy, 2004). Therefore, practitioners and academics alike are keen to accurately measure perceived service quality, highlighting it as a critical success factor for service organizations (e.g. Grönroos, 2008; Jensen and Markland, 1996; Lassar *et al.* 2000; Kumar *et al.* 2009; Parasuraman *et al.* 1988). As aforementioned, albeit several conceptualizations in measuring service quality exist, evidence coming from both of the groups involved in the service encounter is rather limited and contradictory. Some researchers conclude that first-line employees and customers share common perceptions of service (i.e. Schneider and Bowen, 1985) while others note that there are significant divergences (i.e. Nyquist *et al.,* 1985). In light of this contradictory evidence, the present study adopted an in-depth analysis to delineate how customers and front-line employees perceive service quality in a bank service encounter.

As such, emphasis was put on the investigation of groups, producing an aggregate and a detailed view of their service quality perceptions. Our findings unravel similarities and divergences, indicating that in the banking sector, when investigating the quality of a service encounter, it is rather unsafe to measure service quality only from one group's perspective. Given that customer perceptions of (specific aspects of) tangibles, responsiveness and assurance match those of front-line employees, collecting evidence from only one group – front-line employees or customers- is sufficient as they have common evaluation patterns. On the contrary, there are significant differences with regards to how each group evaluates the reliability and empathy of the service, suggesting the need to investigate how both parts of the encounter perceive the quality of the service experience. Consequently, it appears that although SERVPERF is a measurement instrument that can be applied to measure service quality of front-line employees and customers in the banking sector, it can only partially safely reflect a shared evaluation of service quality.

Overall, our findings offer support for the argument of Schneider (1994, p. 74), that “the employees of service organizations constitute not only a delivery mechanism but a strategic diagnostic resource for service organizations”. Practically, mismatches between front-line employees and customers’ perceptions of reliability and empathy highlight the practices and procedures that require change to gap divergences in service quality perceptions between the service encounter parts.

Practically, our findings offer insight into the underlying drivers of service quality, allowing numerous managerial initiatives to improve the service encounter experience. Based on our findings, banks are encouraged to center on those service quality dimensions and corresponding items that are shared by both of the groups involved in the service encounter, namely assurance, responsiveness, and tangibles. In that respect, bank managers could share findings stemming from field research with their front-line employees and discuss them during departmental business unit meetings (Beigi and Shirmohammadi, 2011; Farquhar, 2005). On the other hand, bank administrations ought to try gaining the best possible understanding of how customers form perceptions on the reliability and empathy dimensions, in order to align employees’ actions with customers’ perceptions. Another way to create awareness of service quality mismatches and propose ways of tackling them would be to include specific bank-oriented service quality policies in the employee training programs (e.g. Pettijohn *et al.*, 2007). At the operational level, after completing our proposed procedure, bank management could safely utilize field research findings to update institutional service blueprint protocols, emphasizing and allocating resources to the dimensions and respective items that are perceived as common from both customers and front-line employees.

6. Limitations and Suggestions for Further Research

As with any research, this has some limitations that should be considered when interpreting its findings. First of all, the study refers to the banking industry of a specific country. Future research could test the applicability of the procedure presented and compare findings from banking sectors in other countries. Another limitation of our study pertains to the fact that even in the case of assurance, responsiveness, and tangibles which seem to be similarly perceived by both groups, there is a possibility that they may be prioritized differently, or only partially formed around these common quality dimensions and/or attributes. As such, the endeavor to further understand and reveal the causes of perception misalignment between the groups involved in bank encounters, with regard to reliability and empathy, can be supported by implementing qualitative techniques, such as the laddering method and hierarchical value maps with the use of means-end analysis (Gutman, 1982). Hence, for those dimensions that equivalence has not been confirmed, two different means-end analysis hierarchical value maps could be developed, corresponding to each group (bank services attributes, consequences and the value(s) that the employees and customers explain as critical for their service quality evaluations). Thus, the roots of perception differentiation could be traced, offering bank administrations invaluable data to explain the reasons for misalignment.

Future research could also combine subjective measures of service quality, based on front-line employees and customers, with quality indices that reflect objective measures of service quality, such as Mean Time To Respond (MTTR) and Mean Time To Failure (MTTF) (Aldlaigan and Buttle, 2002; Alsultanny and Wohaishi, 2009). Moreover, other non-functional service related characteristics, such as fees, distance and potential auxiliary services, are also worth considering in order to unravel a holistic view of service quality.

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