STUDIA UNIVERSITATIS
BABEŞ-BOLYAI

OECONOMICA

3/2013

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OECONOMICA

3/2013

December

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YEAR **(Volume 58) 2013**
MONTH **DECEMBER**
ISSUE **3**

STUDIA
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3

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SERVQUAL VERSUS SERVPERF: MODELING CUSTOMER SATISFACTION AND LOYALTY AS A FUNCTION OF SERVICE QUALITY IN TRAVEL AGENCIES

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Abstract. The main objective of the research was to comparatively investigate the appropriateness of the most popular service quality evaluation methodologies (SERVQUAL and SERVPERF) when modeling the impact of service quality on satisfaction and loyalty in the case of offline travel agencies, as well as to debate the inner structures of the two service quality models, and their appropriateness. An online survey was conducted among a sample of almost 300 Romanians who travelled using the services of an offline travel agency at least once during the last five years. The results showed that SERVPERF is the most appropriate methodology to be used in order to model the impact of service quality on satisfaction, repurchase intention and recommendation intention, while for actual recommendation none of the methodologies significantly help in explaining the impact of service quality.a

JEL Classification: M31, L30

Keywords: travel agency, satisfaction, loyalty, service quality, SERVQUAL, SERVPERF

1. Introduction

High service quality is a key success factor in service industries and especially in tourism as it contributes to enhancing customer satisfaction (Fick and Ritchie, 1991; Johns et al, 2004). Higher service quality generates higher customer satisfaction, and, furthermore, service quality and customer satisfaction determine customer loyalty (Cristobal et al., 2007; Cronin et al., 2000). Moreover, not only that loyal customers are likely to buy additional services, spread positive word-of-mouth, and pay higher prices, but they can also improve the service efficiency due to the experience curve effect (Reichheld and Sasser, 1990).

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Therefore, it is natural that organizations recognize several potential benefits derived from implementing service quality programs, including increasing customer satisfaction, customer retention, customer loyalty, positive word-of-mouth, increasing opportunities for cross-selling, employee benefits, improved corporate image, profit gains, and financial performance (Al Bassam and Al Shawi, 2011).

In this paper we comparatively investigate the expediency, fitness and validity of the most popular service quality evaluation methodologies (SERVQUAL and SERVPERF) when modeling the impact of service quality on satisfaction and loyalty in the case of offline travel agencies. Moreover, the inner structures of the two service quality models, as well as their appropriateness for the particular case of travel agencies, are debated after comparing them with restructured models based on principal component analysis.

The relevance of such a scientific pursuit can be depicted both from theoretical and practical perspective. On one hand, from a theoretical point of view, even though the literature already comprises several investigations aimed at emphasizing the most suited service quality assessment methods, those specifically regarding services provided by travel agencies are scarce (and rather non-conclusive). On the other hand, considering its potential practical implications, the results of such a research can guide the way travel agencies (particularly those acting offline and addressed to Romanian travelers) assess their service quality.

2. Literature review

Service quality, satisfaction, and loyalty

Service quality, satisfaction and loyalty are three of the most debated and analyzed concepts in the literature.

Considering some of the most popular approaches in the literature service quality can be seen as a consumer attitude – related but not equivalent to satisfaction – resulting from a comparison of expectations with perceptions of performance (Parasuraman et al., 1988), or as the extent to which a service meets customers' needs or expectations (Wisniewski and Donnelly, 1996).

Satisfaction can be seen as a post-purchase evaluation of products or services taking into consideration the expectations (Kotler and Armstrong, 2012). Normally, higher service quality should generate higher customer satisfaction (Shahin and Janatyan, 2011). For example, in the hotel industry, customer satisfaction depends, among other factors, on customer expectation, perceived value, and perceived quality, while satisfaction generates customer loyalty (Mohajerani and Miremadi, 2012).

Moreover, especially in the tertiary sector, customer satisfaction and loyalty are strongly correlated. Empirically, this has been proven, even in the particular case of travel agencies (Zairi, 2000; Anderson et al., 2004; Kobylanski, 2012; Campo and Yagüe, 2007).

Brand loyalty can be seen as the likeliness of a customer to switch to another brand, especially when the brand's price, product features, communication, and/or distribution programs change (Aaker, 1991). Oliver (1999) emphasizes the fact that loyalty should be seen as a commitment to repurchase a product/service consistently in the future, despite different situational influences or marketing

efforts from competitor brands. Loyalty can be dually conceptualized as having a behavioral and, respectively, an attitudinal side (Moisescu and Vũ, 2011), attitudinal loyalty being reflected by cognitive, affective, and behavioral intent dimensions (repurchase intention, recommendation intention etc.), while behavioral loyalty being reflected by repeat buying behavior and actual made recommendations.

Measuring service quality

Analyzing the existing literature on service quality measurement, Martinez and Martinez (2010) classified service quality models in three distinct groups: multidimensional reflective, multidimensional formative, and, respectively, multidimensional formative–reflective models. The RSQS service quality model developed by Dabholkar et al. (1996) is a multidimensional reflective model. This model assumes that the proposed dimensions are different forms manifested by perceived service quality. Likewise, these dimensions cause variations in their respective sub-dimensions, and, finally, the indicators are observable representations of each sub-dimension. On the other hand, service quality models such as GM (Grönroos Model), ROM (Rust and Oliver Model), SERVQUAL and SERVPERF are conceptually multidimensional formative models. The service quality construct is formed by its dimensions and this does not exist separately from its dimensions. Perceived service quality is an algebraic construction derived from dimensions, so service quality and dimensions are not separate concepts. Nevertheless, BCM (Brady and Cronin Model) combines both the formative and reflective approaches. The service quality construct is formed by the primary dimensions. At the same time these dimensions are reflected by several sub-dimensions that act as manifestations of the dimensions. However, BCM breaks with the formative–reflective label when it is operationalized by adding items to measure dimensions and sub-dimensions. Therefore, its conceptualization does not correspond with the form of operationalizing the model.

According to Grönroos's model (1982, 1984) service quality is dependent on expected service and perceived service. Word of mouth, corporate image, advertising, pricing and personal factors are the variables that compound expected service quality. Consumer's view of technical and functional services dimensions form the perceived quality. Technical quality refers to the outcome of the service performance whereas functional quality defines customers' perceptions of the interactions that take place during service delivery. Grönroos also claims that under certain conditions corporate image can act as another service quality dimension, although, in reality, it is a variable that moderates the relationships between quality dimensions (technical and functional) and perceived quality (Martinez and Martinez, 2010).

Grönroos's model assumes that technical solutions or technical abilities of the employees influence the technical quality dimension whereas the functional quality dimension is determined by customer-oriented physical and technical resources, accessibility of the firm's services, the consumer orientation of self-service systems, and the firm's ability to maintain continuous contact with its customers (Martinez and Martinez, 2010).

Rust and Oliver (1994) propose a three component model: the service product, the service delivery and the service environment.

As a result of an exploratory research, Parasuraman et al. (1985) developed the SERVQUAL model which represents service quality as a gap between customer's perceptions of the service received and customer's expectations for a service offering. The authors argued that, regardless of the type of service, consumers evaluate service quality using the same generic criteria, which can be grouped into five dimensions: tangibles (physical facilities, equipment and appearance of personnel), reliability (ability to perform the promised service dependably and accurately, responsiveness (willingness to help customers and provide prompt service), assurance (knowledge and courtesy of employees and their ability to inspire trust and confidence), and empathy (caring and individualized attention that the firm provides to its customers). Dimensions of service quality are correlated, and they form the overall service quality perception. The five dimensions were identified empirically using factor analysis and are considered separate attributes, contributing independently to customers' assessments of service performance (Johns et al, 2004).

Due to criticism Parasuraman et al. (1991) modified SERVQUAL by reviewing the concept of expectations and by weighting the dimensions (based on importance scores). In 1994 the structure of the model was changed to include the discrepancy between perceived service and adequate service.

The SERVQUAL instrument has been used in a range of service settings, including travel agents (Fick and Ritchie, 1991; Lam and Zhang, 1999; Johns et al, 2004), tour guiding (Luk, 1997) and hospitality industry (Saleh and Ryan, 1991; Stevens et al, 1995; Luk & Layton, 2004; Kumar et al, 2011; Khalifeh and Som, 2012; Kim et al., 2009).

In the tourism sector most authors use modified and adapted SERVQUAL models for their research of services quality (Blešić et al., 2011). Based on a 33 item questionnaire, Saleh and Ryan (1991) identified five determinants of service quality in hotel industry: sociability, tangibles, trust, avoiding of sarcasm and empathy. For measuring lodging quality Getty and Thompson (1994) developed a scale named LODGQUAL. Stevens et al. (1995) proposed an instrument containing 29 items on a seven point Likert scale for evaluation of quality service in restaurants based on SERVQUAL model, which is called DINSERV (consisting of five dimensions: assurance, empathy, reliability, responsiveness and tangibles). Khan (2003) proposed ECOSERV scale to be applied to measure service quality in natural areas such as ecotourism destinations. The instrument consists of 30 attributes grouped into six service dimensions: assurance, reliability, responsiveness, empathy, ecotangibles and tangibles.

Cronin and Taylor (1992) developed the SERVPERF model arguing that service quality is a performance-only measure. Proponents argued that SERVPERF is shorter, theoretically superior and more reflective of service quality than SERVQUAL. This measure explained more of the variance in an overall measure of service quality than SERVQUAL. Moreover, it obtained psychometrically superior assessment of service quality in terms of construct validity and operational efficacy through its performance items (Cronin & Taylor 1992). Jain and Gupta (2004) found that the SERVPERF scale was a more convergent and discriminate valid scale than SERVQUAL in the measurement of service quality in fast food restaurants. The same conclusion, that SERVPERF is a better predictor of service quality resulted from the study of Nadiri and Hussain

(2005) in hotel industry. Al Khattab and Aldehayyat (2011) argue as a conclusion of their study on perceptions of service quality on Jordanian hotels that a performance-only measurement (SERVPERF) is a good predictor of service quality, and sufficient. A number of studies reached the conclusion that performance scores provide better statistical results and explanatory power than gap scores based on various reliability and validity criteria (Cronin & Taylor, 1992, 1994; Johns & Howard, 1998; Teas, 1993; Luk & Layton, 2004).

Teas (1993, 1994) developed the Evaluated Performance model that measures the gap between perceived performance and the ideal amount of a feature, rather than the customers' expectations.

Dabholkar et al. (1996) argued that SERVQUAL has not been successfully adapted to and validated for the retail store environment. They suggested that the dimensionality of service quality in a retail setting may be dissimilar to that of service quality in pure service industries. Using both quantitative and qualitative research methods, they proposed RSQS (Retail Service Quality Scale), a multilevel model in which retail service quality is viewed as a higher-order factor that is defined by two additional levels of attributes. The instrument includes five primary dimensions such as physical aspects, reliability, personal interaction, problem solving and policy as well as six sub-dimensions, i.e. appearance, convenience, promises, doing it right, inspiring confidence and being courteous/helpful. Dabholkar et al. (1996) used only performance- based measures and found that their scale possessed strong validity and reliability and adequately captured customers' perceptions of retail service quality.

Brady and Cronin (2001) suggested a hierarchical and multidimensional model. These authors combined the traditional approach to service quality – i.e., the Tri-component model of service quality by Rust and Oliver (1994) – with the multi-level conceptualization of service quality – i.e. Dabholkar et al. (1996). They described a third-order factor model, in which service quality is explained by three primary dimensions, i.e. interaction quality, physical environment quality and outcome quality. Each of these dimensions consists of three corresponding sub-dimensions, such as attitude, behavior and experience (interaction quality); ambient conditions, design and social factors (physical environment quality); waiting time, tangibles and valence (outcome quality). According to these authors, the proposed model improves our understanding of three basic issues: (1) what defines service quality perceptions, (2) how service quality perceptions are formed, and (3) how important it is where the service experience takes place.

3. Methodology

The main objective of our research was to comparatively investigate the expediency, fitness and validity of the most popular service quality evaluation methodologies (SERVQUAL and SERVPERF) when modeling the impact of service quality on satisfaction and loyalty in the case of offline travel agencies, as well as to debate the inner structures of the two service quality models, and their appropriateness for the particular case of offline travel agencies.

A questionnaire based survey was conducted among a sample of 286 Romanian adults who purchased travel services or package tours from offline travel agencies at least once within the last five years. The data was collected

online for a period of two months (March-April) in 2012, with the voluntary help of 42 master students, each of them disseminating and distributing the online link to the questionnaire by email and instant messages addressed to their own contacts, or by posting it within various online social and professional networks. Table 1 outlines the structure of the investigated sample.

Table 1 - Sample demographics

Male	104	19-22 years	32
Female	182	23 years	35
		24 years	51
High-school or lower	34	25 years	26
Bachelor studies	157	26 years	23
Master studies	84	27 years	19
PhD or higher	11	28-29 years	19
		30-31 years	19
Under 1000 lei	65	32-34 years	21
1000–2000 lei	125	35-39 years	17
2001–3000 lei	42	40-50 years	24
3001–4000 lei	31		
Above 4000 lei	23		

In order to assess service quality provided by offline travel agencies we used 21 individual items to reflect the five classic dimensions of service quality (according to SERVQUAL, SERVPERF and other service quality evaluation methodologies): (1) tangibles – physical facilities, equipment, staff appearance; (2) reliability – ability to perform promised and advertised service dependably, accurately; (3) responsiveness – willingness to help and assist customers, to provide prompt service; (4) assurance – staff competence, politeness, and ability to inspire trust; (5) empathy – customer care and understanding, customization, access. The items are outlined in Table 2.

Table 2 - Items for measuring service quality for offline travel agencies

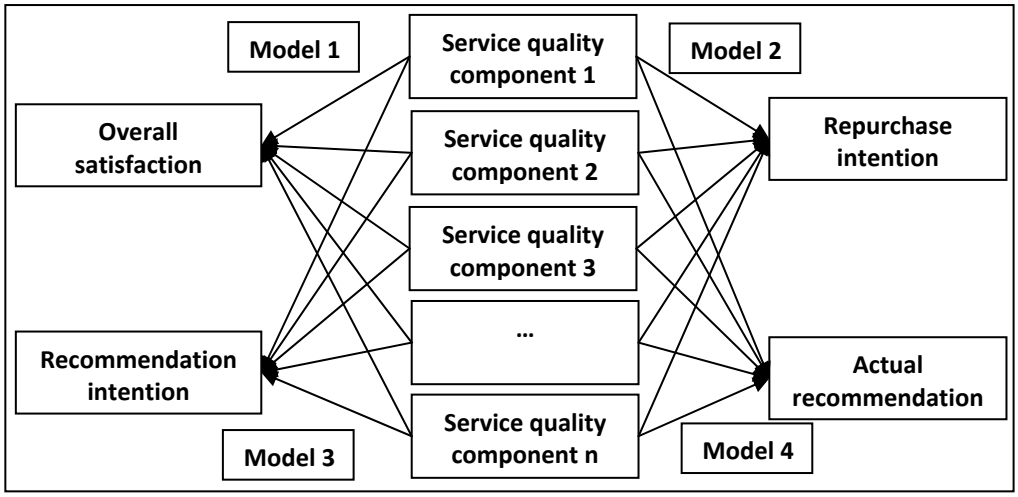
$I_{(1)1}$	Modern equipment and facilities
$I_{(1)2}$	Documents and promotional materials appearance
$I_{(1)3}$	Agency staff appearance - clean, neat
$I_{(1)4}$	Outward appearance of agency – clean, neat, good condition
$I_{(1)5}$	Outward appearance of agency – esthetic look
$I_{(1)6}$	Inward appearance of agency – clean, neat, good condition
$I_{(1)7}$	Inward appearance of agency – esthetic look
$I_{(2)1}$	Providing services exactly as promised/advertised, in strict compliance with timeframes
$I_{(2)2}$	Providing services exactly as promised, for the first time, with no fixes needed
$I_{(2)3}$	Providing only high quality services to customers
$I_{(3)1}$	Agency staff being always available for helping/serving customers
$I_{(3)2}$	Agency staff communicating exact time frames of services or actions taken to help
$I_{(3)3}$	Agency staff delivering prompt service

$I_{(3)4}$	Agency staff quickly reacting to address any dissatisfaction/problem
$I_{(4)1}$	Agency staff inspiring trust and confidence
$I_{(4)2}$	Agency staff having a high degree of professionalism and knowledge in their field
$I_{(4)3}$	Agency staff being permanently courteous and polite
$I_{(5)1}$	Agency staff understanding of specific needs and wants of customers
$I_{(5)2}$	Agency staff showing genuine interest in customers and their needs
$I_{(5)3}$	Agency staff approaching each customer individually and customized
$I_{(5)4}$	Agency working hours being very convenient to customers

Expectations were assessed for each service quality item using an extended Likert scale ranging from 1 = "strongly disagree" to 7 = "strongly agree" (e.g.: "In order for me to like it and consider it excellent, a travel agency should have modern equipment and facilities"). Perceptions were evaluated for each item using a scale ranging from 1 = "entirely false" to 7 = "entirely true", asking respondents to relate to the offline travel agency from which they had made their most recent travel service or package tour purchase (e.g.: "The agency had modern equipment and facilities"). Asking respondents to refer to the same travel agency, overall satisfaction was assessed on a scale from 1 to 5 ("Unsatisfied", "Rather unsatisfied", "Neither/nor", "Rather satisfied", "Satisfied"), while loyalty was depicted using three dimensions: repurchase intention on a scale from 1 to 5 ("certainly not", "probably not", "don't know", "probably yes", "certainly yes"), recommendation intention (idem), and previously made recommendation on a scale from 1 to 4 ("negative", "none", "neutral", "positive").

In order to assess the internal consistency reliability associated with scores derived from our scales, we calculated Cronbach's Alpha for: the set of variables reflecting expectations (21 items; α=0.941), the set of variables depicting perceptions (21 items; α=0.970), the whole set of variables measuring service quality (42 items; α=0.962), and the set of variables identifying perception-expectation gaps (21 items ranging from -6 to +6; α=0.944). Values (>0.9) suggest excellent internal consistency reliability in all cases.

Figure 1 - Proposed models



We proposed four linear models (Figure 1) in order to investigate the combined impact of the set of components reflecting service quality (as predictors) on customer satisfaction and brand loyalty (as dependent variables). We hypothesized that each of the four models could significantly explain the variation of each of the four dependent variables taken into consideration. Accordingly to the proposed models, we examined the relationship between service components, as predictors, on one hand, and overall satisfaction, repurchase intention, recommendation intention and actual recommendation, as dependent variables, on the other hand, by multiple regression analyses.

4. Results and discussion

Firstly, we tested the four proposed models using the SERVQUAL methodology for assessing service quality, namely using perception-expectation gap scores in order to evaluate the five components of service quality: tangibles, reliability, responsiveness, assurance, and empathy. Therefore, in order to operationalize the measurements, we computed gap-scores for each item, and then mean gap-scores for each of the five groups of items reflecting the five components of service quality:

$$G_{(i)j} = P_{(i)j} - E_{(i)j}$$

$$G_{(i)} = \frac{1}{k_i} \cdot \sum_{j=1}^{k_i} G_{(i)j}$$

where:

- $E_{(i)j}$ = expectation for item "j" of component "i"
- $P_{(i)j}$ = perception for item "j" of component "i"
- $G_{(i)j}$ = gap score for item "j" of component "i"
- $G_{(i)}$ = mean gap score for component "i"
- i = 1..5 (the five components of service quality)
- j = 1..k_i; k_i = number of items for component "i"

Table 3 - Multiple linear regressions for the proposed models using *perception-expectation gap scores* and five components for assessing service quality

		Dependent variable							
		Model 1 Overall satisfaction		**Model 2** Repurchase intention		**Model 3** Recommendation intention		**Model 4** Actual recommendation	
		Standardized coefficients:		Standardized coefficients:		Standardized coefficients:		Standardized coefficients:	
		Beta	*p*	*Beta*	*p*	*Beta*	*p*	*Beta*	*p*
Predictor	Tangibles	-.050	.404	-.004	.953	-.012	.843	-.026	.690
	Reliability	.344	.000	.263	.002	.369	.000	.314	.000
	Responsiveness	.151	.090	-.020	.830	.044	.613	.060	.528
	Assurance	.094	.285	.214	.018	.038	.657	.069	.466
	Empathy	.059	.506	.142	.953	.193	.028	.083	.387
		R^2=.319		**R^2=.291**		**R^2=.342**		**R^2=.218**	
		Anova F-Test F(5, 280) = 26.25; p<.001		Anova F-Test F(5, 280) = 23.03; p<.001		Anova F-Test F(5, 280) = 29.08; p<.001		Anova F-Test F(5, 280) = 15.64; p<.001	

As it can be seen in table 3, the five service quality components measured accordingly to SERVQUAL as perception-expectation gap scores explain 31.9% of the variation of customer satisfaction, 29.1% of the variation of repurchase intention, 34.2% of the variation of recommendation intention, and, respectively, 21.8% of the variation of actual recommendation. Therefore, based on the SERVQUAL methodology, recommendation intention is the most impacted dimension by service quality, while actual recommendation being the least impacted one.

The results in table 3 also show that tangibles and responsiveness do not significantly contribute to any of the models, assurance only contributes significantly to the model regarding repurchase intention, while empathy only to the one regarding recommendation intention. Nevertheless, reliability contributes significantly to all four models, thus having the highest impact on satisfaction and loyalty when service quality components are measured according to the SERVQUAL methodology.

The literature does not unanimously agree on the accuracy of considering gap scores as representative for evaluating service quality (as in SERVQUAL). The SERVPERF methodology which focuses on perceptions, rather than gap scores between perceptions and expectations, has several potential benefits and might better explain variations of outputs (satisfaction, loyalty etc.) in certain cases. Therefore, we tested the same four proposed models using the SERVPERF methodology for evaluating service quality, namely using perception scores (as opposite to perception-expectation gap scores) in order to assess the five components of service quality. Operationalizing the measurements meant computing the mean perception scores for each of the five groups of items reflecting the five components of service quality:

$$P_{(i)} = \frac{1}{k_i} \cdot \sum_{j=1}^{k_i} P_{(i)j}$$

where:

- $P_{(i)j}$ = perception for item "j" of component "i"
- $P_{(i)}$ = mean perception score for component "i"
- i = 1..5 (the five components of service quality)
- j = 1..k_i; k_i = number of items for component "i"

Table 4 - Multiple linear regressions for the proposed models using *perception scores* and five components for assessing service quality

		Dependent variable							
		Model 1 Overall satisfaction		**Model 2** Repurchase intention		**Model 3** Recommendation intention		**Model 4** Actual recommendation	
		Standardized coefficients:		Standardized coefficients:		Standardized coefficients:		Standardized coefficients:	
		Beta	*p*	*Beta*	*p*	*Beta*	*p*	*Beta*	*p*
Predictor	Tangibles	-.014	.828	-.017	.797	.033	.619	.036	.627
	Reliability	.441	.000	.223	.020	.304	.001	.172	.098
	Responsiveness	.217	.049	-.080	.504	-.030	.803	.077	.558
	Assurance	.068	.500	.295	.008	.057	.603	.043	.718
	Empathy	-.023	.818	.197	.069	.272	.012	.175	.138
		R^2=.440		**R^2=.340**		**R^2=.352**		**R^2=.215**	
		Anova F-Test F(5, 280) = 44.04; p<.001		Anova F-Test F(5, 280) = 28.90; p<.001		Anova F-Test F(5, 280) = 30.40; p<.001		Anova F-Test F(5, 280) = 15.30; p<.001	

As it can be seen in table 4, the five service quality components measured accordingly to SERVPERF as perception scores explain 44% of the variation of customer satisfaction, 34% of the variation of repurchase intention, 35.2% of the variation of recommendation intention, and, respectively, 21.5% of the variation of actual recommendation. Based on the SERVPERF methodology, satisfaction is the most impacted dimension by service quality, while actual recommendation being the least impacted one.

The results in table 4 also show that tangibles do not significantly contribute to any of the models, while none of the service quality components contribute to the model regarding actual recommendation. Nevertheless, reliability contributes significantly to all other models, while responsiveness, assurance and empathy only contribute significantly to the model regarding satisfaction, repurchase intention, and, respectively, recommendation intention. Nevertheless, reliability is reinforced as the component to have the highest impact on satisfaction and loyalty when service quality components are measured using SERVPERF.

Considering that the classic five-dimension grouping of service quality items might not be the most appropriate in the case of offline travel agencies, we further used principal component analysis in order to restructure the grouping of the 21 items into components, both in the case of using perception-expectation gap scores, and, respectively, perception scores as means for assessing service quality.

Table 5 - Principal component analysis of service quality items assessed as perception-expectation gap scores

Item	Component		
	1	2	3
Providing services exactly as promised, for the first time …	.827	.215	.114
Agency staff communicating exact time frames of services or …	.787	.180	.267
Providing services exactly as promised, in strict compliance …	.786	.265	.093
Providing only high quality services to customers	.775	.201	.238
Agency staff quickly reacting to address any dissatisfaction …	.769	.203	.287
Agency staff being always available for helping/serving …	.752	.177	.057
Agency staff delivering prompt service	.746	.139	.191
Agency staff showing genuine interest in customers and …	.688	.206	.523
Agency staff understanding of specific needs and wants of …	.670	.158	.495
Agency staff having a high degree of professionalism and …	.599	.218	.482
Agency staff being permanently courteous and polite	.596	.138	.550
Outward appearance of agency – esthetic look	.101	.832	.149
Outward appearance of agency – clean, neat, good condition	.149	.816	.187
Inward appearance of agency – esthetic look	.310	.793	.067
Inward appearance of agency – clean, neat, good condition	.327	.789	.056
Agency staff appearance - clean, neat	.197	.634	.320
Modern equipment and facilities	.153	.525	.342
Agency working hours being very convenient to customers	.288	.221	.594

Documents and promotional materials appearance	-.005	.448	.588
Agency staff approaching each customer individually and …	.534	.217	.565
Agency staff inspiring trust and confidence	.539	.155	.552
Extraction Method: Principal Component Analysis (PCA) **Rotation Method:** Varimax with Kaiser Normalization (converged in 7 iterations) **Kaiser-Meyer-Olkin** Measure of Sampling Adequacy: .935 **Bartlett's** Test of Sphericity: Chi-Square = 4415.959; df = 210; p<0.001			

As results in table 5 suggest, when using perception-expectation gap scores for measuring service quality the items should be grouped into three components (not five), among which the second one comprises only items that were initially grouped as tangibles (even though not all of them).

Table 6 - Multiple linear regressions for the proposed models using perception-expectation gap scores and three components for assessing service quality

		Dependent variable							
		Model 1 Overall satisfaction		**Model 2** Repurchase intention		**Model 3** Recommendation intention		**Model 4** Actual recommendation	
		Standardized coefficients:		Standardized coefficients:		Standardized coefficients:		Standardized coefficients:	
		Beta	*p*	*Beta*	*p*	*Beta*	*p*	*Beta*	*p*
Pred.	Component 1	.598	.000	.497	.000	.498	.000	.460	.000
	Component 2	-.037	.558	.021	.748	-.016	.800	.007	.913
	Component 3	-.028	.726	.028	.730	.097	.222	-.016	.850
		R^2=.312		**R^2=.281**		**R^2=.319**		**R^2=.204**	
		Anova F-Test F(5, 280) = 42.69; p<.001		Anova F-Test F(5, 280) = 36.68; p<.001		Anova F-Test F(5, 280) = 43.95; p<.001		Anova F-Test F(5, 280) = 24.13; p<.001	

Furthermore, we re-tested the four proposed models using perception-expectation gap scores, but grouped into only three components, as resulted from the principal component analysis. As table 6 shows, in this case the three service quality components measured as perception-expectation gap scores explain 31.2% of the variation of customer satisfaction, 28.1% of the variation of repurchase intention, 31.9% of the variation of recommendation intention, and, respectively, 20.4% of the variation of actual recommendation. Therefore, based on perception-expectation gap scores and three components, recommendation intention and satisfaction are the most impacted dimensions by service quality, while actual recommendation being the least impacted one. The results in table 6 also show that in this case only the first component contributes to any of the four models regarding satisfaction and loyalty.

Table 7 - Principal component analysis of service quality items assessed as perception scores

Item	Component	
	1	2
Agency staff understanding of specific needs and wants of customers	.862	.300
Agency staff quickly reacting to address any dissatisfaction or problem	.858	.257
Agency staff showing genuine interest in customers and their needs	.849	.322
Agency staff being always available for helping/serving customers	.842	.272
Agency staff being permanently courteous and polite	.833	.292
Providing only high quality services to customers	.817	.319
Providing services exactly as promised, for the first time […]	.806	.281
Agency staff communicating exact time frames of services or […]	.802	.364
Agency staff inspiring trust and confidence	.796	.309
Providing services exactly as promised, in strict compliance […]	.769	.355
Agency staff having a high degree of professionalism and […]	.767	.361
Agency staff approaching each customer individually and customized	.764	.376
Agency staff delivering prompt service	.763	.342
Agency working hours being very convenient to customers	.514	.419
Outward appearance of agency – esthetic look	.247	.845
Outward appearance of agency – clean, neat, good condition	.254	.843
Inward appearance of agency – esthetic look	.382	.775
Inward appearance of agency – clean, neat, good condition	.398	.765
Agency staff appearance - clean, neat	.349	.765
Documents and promotional materials appearance	.302	.754
Modern equipment and facilities	.250	.732

Extraction Method: Principal Component Analysis (PCA)
Rotation Method: Varimax with Kaiser Normalization (converged in 3 iterations)
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: .953
Bartlett's Test of Sphericity: Chi-Square = 6613.889; df = 210; p<0.001

As table 7 shows, when using perception scores for measuring service quality the items should be grouped into two components (not three or five), among which the second one comprises all the items that were initially grouped as tangibles.

Table 8 - Multiple linear regressions for the proposed models using perception scores and two components for assessing service quality

		Dependent variable							
		Model 1 Overall satisfaction		**Model 2** Repurchase intention		**Model 3** Recommendation intention		**Model 4** Actual recommendation	
		Standardized coefficients:		Standardized coefficients:		Standardized coefficients:		Standardized coefficients:	
		Beta	*p*	*Beta*	*p*	*Beta*	*p*	*Beta*	*p*
Pred.	Component 1	.657	.000	.579	.000	.550	.000	.433	.000

	Component 2	-.024	.708	-.009	.899	.044	.510	.039	.589
		R^2=.411		**R^2=.328**		**R^2=.338**		**R^2=.212**	
		Anova F-Test F(5, 280) = 98.89; p<.001		Anova F-Test F(5, 280) = 69.201; p<.001		Anova F-Test F(5, 280) = 72.166; p<.001		Anova F-Test F(5, 280) = 38.127; p<.001	

We also re-tested the proposed models using perception scores, but only grouped into two components, as resulted from the principal component analysis. Table 8 shows that the two service quality components measured as perception scores explain 41.1% of the variation of customer satisfaction, 32.8% of the variation of repurchase intention, 33.8% of the variation of recommendation intention, and, respectively, 21.2% of the variation of actual recommendation. Therefore, based on perception scores and two components, satisfaction is the most impacted dimension by service quality, while actual recommendation being the least impacted one. The results also show that only one component – the non-tangibles – contributes to any of the four models regarding satisfaction and loyalty.

5. Conclusions, research limitation and future research directions

After comparatively investigating the expediency of the most popular service quality evaluation methodologies – SERVQUAL and SERVPERF – when modeling the impact of service quality on satisfaction and loyalty, we can state that in the case of offline travel agencies SERVPERF is clearly a more suited methodology in comparison to SERVQUAL, as it better explains the variation of customer satisfaction and repurchase intention, while the explanatory capacity in the case of recommendation intention and actual recommendation is similar.

Nevertheless, the principal component analyses (PCA) proved that the five service quality components structure related to SERVPERF and SERVQUAL is not actually the most appropriate grouping of individual items reflecting service quality. Thus, if perception-expectation gap scores (SERVQUAL's "philosophy") are considered, only three components result according to PCA, while when taking into consideration perception scores (SERVPERF's "philosophy") there are only two resulting components: tangibles and non-tangibles. However, modeling the impact of service quality on satisfaction and loyalty considering these reduced structures did not produce better explanatory power for the models (but rather poorer).

Overall, considering the fact that using SERVPERF none of the service quality components contributed to the model in the case of actual recommendation, we might assume – within the limits of the exploratory and empirical nature of our research – that in the case of offline travel agencies SERVPERF is the most appropriate methodology to be used in order to model the impact of service quality on satisfaction, repurchase intention and recommendation intention, while for actual recommendation, even though SERVQUAL produced the best result in explaining its variation, none of the methodologies significantly help in explaining the impact of service quality.

Table 9 - Expediency comparison on modeling the impact of service quality on satisfaction and loyalty

Service quality assessment methodology	**Model 1** Overall satisfaction	**Model 2** Repurchase intention	**Model 3** Recommendation intention	**Model 4** Actual recommendation
Perception-expectation gap scores. Five components.	R^2=.319 Contributors: Reliability	R^2=.291 Contributors: Reliability Assurance	R^2=.342 Contributors: Reliability Empathy	R^2=.218 Contributors: Reliability
Perception scores. Five components.	R^2=.440 Contributors: Reliability Responsiveness	R^2=.340 Contributors: Reliability Assurance	R^2=.352 Contributors: Reliability Empathy	R^2=.215 Contributors: None
Perception-expectation gap scores. Three components	R^2=.312 Contributors: 1st component (no tangibles)	R^2=.281 Contributors: 1st component (no tangibles)	R^2=.319 Contributors: 1st component (no tangibles)	R^2=.204 Contributors: 1st component (no tangibles)
Perception scores. Two components	R^2=.411 Contributors: 1st component (no tangibles)	R^2=.328 Contributors: 1st component (no tangibles)	R^2=.338 Contributors: 1st component (no tangibles)	R^2=.212 Contributors: 1st component (no tangibles)

Inherently, the research has some limitations especially due to its exploratory and empirical nature: the sample comprised only Romanian customers, the data was collected exclusively online (within an under 50 years population, composed exclusively of persons who had Internet access), the sample procedure was empirical and non-probabilistic, while the actual sample size (286) can be considered rather small, especially due to the fact that multiple linear regression needs large samples in order to be representative.

However, the research is relevant as it hypothesizes the superiority of a certain service quality evaluation methodology when modeling satisfaction and loyalty in a very important economic sector. Moreover, given the exploratory results obtained, the study can be further developed starting from a larger and probabilistic sample, with data collected offline, and with a more generous list of individual items directed at reflecting service quality.

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TECHNICAL EFFICIENCY OF SOUTH AFRICAN BANKS IN GENERATING INTEREST AND NONINTEREST INCOME: A STOCHASTIC FRONTIER ANALYSIS

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Abstract. This study applies stochastic frontier analysis to estimate the technical efficiencies of the four largest banks in South Africa, for the period 1994 to 2010, with regard to their generation of interest income and noninterest income. Interest income and noninterest income of the banks are investigated separately using a stochastic frontier production function model. A stochastic frontier output-orientated distance function is also estimated in order to investigate the changes in interest and noninterest income for the banks. Using the stochastic production frontier model, it is found that deposits do not have any significant influence on the levels of interest and noninterest incomes of these banks. The inefficiency effects for the generation of interest income were found to significantly decline for larger values of loans and investments and interest costs, but increased with increasing values of financial capital and also increased over time. Using an alternative approach involving an output distance function for the two income variables, we find that deposits have a significant effect on the explanation of the interest and noninterest incomes and that inefficiency effects are still significant in explaining the generation of these incomes.

JEL classification: C50, G21, L21

Keywords: Technical efficiency, Stochastic Frontier Analysis, Production function, Bank inputs/outputs, Output distance function, South African banks.

1. Introduction

Banks are in the business of buying and selling money and simultaneously render financial services to customers. This means that in the economy banks buy money from surplus economic units (borrowing activity) and sell money to deficit

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Note: A first version of this paper was presented at the Conference in Memory of Lennart Hjalmarsson, 7-8 December, 2012, School of Business, Economics and Law, University of Gothenburg.

economic units (lending activity), while customers can utilise various services like the deposit function, collection function, payment function, insurance, etc. Banks exist because of the conflict between the requirements of lenders and borrowers with regard to risk, return and term to maturity. In the process of intermediating between surplus and deficit economic units, banks face various types of risk. These risks include, inter alia, risks such as credit risk, liquidity risk, and interest rate risk. Banks have to manage these risks and by doing that, bank management attempts to maximise profits. In order to maximise profits, banks must decide on how much risk the bank is willing to be exposed to, because there is an inverse relationship between risk and reward. However, greater risk manifests itself in greater volatility of net income and the market value of a bank's stockholders' equity.

A fundamental risk faced by all banks is the interest rate risk, and this risk is managed by a bank's asset and liability management committee (Koch and MacDonald, 2003). In a changing economic environment, this committee recommends pricing, investment, funding and marketing strategies to achieve the desired trade-off between risk and expected return (Falkena*,* Kok and Meijer 1987). The lending activity generates interest income for the bank, while the borrowing activity results in the bank having to pay interest to the surplus economic units. The difference between the interest received (generated by the lending rate) and the interest paid (generated by the borrowing rate) is the net interest income the bank receives from being involved in lending and borrowing activities.

Interest income is an important source of income for South African banks, although there is a noticeable change in the composition of bank income over the past decade. South African banks are experiencing pressure from foreign banks and non-bank financial institutions. These non-bank financial institutions render credit services that are not available at traditional banks. There have also been a number of changes in the regulatory environment, product offerings, and the number of participants which have resulted in a greater level of competition in the market from smaller banks, such as Capitec Bank and African Bank. These two banks have targeted the low-income and the previously unbanked market. These developments forced traditional banks to introduce new banking products and services, and as these services are paid for, it led to an increase in noninterest income. Two broad categories of income constitute the income (receipts) of a bank, namely interest income and noninterest income. The question now is to what extent did this change in the composition of bank income, affected the technical efficiency of South African banks in generating interest income and noninterest income.

Over the last three decades, a large number of studies on bank productivity and efficiency have applied quantitative techniques like data envelopment analysis (DEA) and stochastic frontier analysis (SFA), to estimate different types of efficiencies. DEA estimates the frontier by finding a set of linear segments that envelop the observed data, combining all the input and output data on sample firms into a single measure of productive efficiency. SFA involves specifying a functional form for the frontier and then estimating its parameters using econometric techniques. Some other studies applied the DEA-type Malmquist total factor productivity to examine productivity growth and the contributors to productivity change.

These performance studies were at both the firm/corporate level (e.g*.,* Drake, 2001; Seiford and Zhu, 1999; Devaney and Weber, 2000; Berger and Humphrey, 1997; Halkos and Salamouris, 2004; Mendes and Rebelo, 1999; Luo, 2003; Resti, 1997; Kwan, 2006; van der Westhuizen, 2008; van der Westhuizen and Oberholzer, 2009; Matthews and Zhang, 2010; Fung and Cheng, 2010; Manlagñit, 2011;

Chang et al., 2012) and at the branch level (e.g., Sherman and Ladino, 1995; Sherman and Gold, 1985; Vassiloglou and Giokas, 1990; Oral and Yolalan, 1990; O'Donnell and van der Westhuizen, 2002; van der Westhuizen and Oberholzer, 2003; Oberholzer and van der Westhuizen, 2004; van der Westhuizen, 2012).

This study applies SFA models to estimate the technical efficiencies of the four largest banks in South Africa, with regard to the generation of interest income and noninterest income. This is the first study to apply SFA to estimate technical efficiencies of South African banks at the corporate level. A similar study by Van der Westhuizen (2010) applied DEA to estimate the efficiency of thirty seven regions of a large South African bank. The remainder of this paper is structured as follows: in Section 2, the South African banking sector is briefly discussed. The empirical models for investigating banking efficiency are discussed in Section 3, together with the SFA model that is applied in this paper. In Section 4 the data are discussed, followed by the presentation of empirical results in Section 5. The results of the paper are discussed and summarised in Section 6.

2. The South African Banking Sector

The South African financial sector is dominated by the four banks, Amalgamated Banks of South Africa (ABSA), First National Bank, Nedbank and Standard Bank. According to the BA 900 reports (Department of Bank Supervision, 2011), these four banks control over 84% of total deposits and assets in South Africa.

Over the last decade, South African banks saw the first substantial rewrite of the Banks' Act and Regulations since 1990, following the adoption of the international guidelines, called Basel II, which took effect on 1st January, 2008 (Booysen, 2008). Banks also saw the introduction of the National Credit Act, as well as the Financial Sector Charter. All these changes had the effect that banks experienced pressure on their lending activities and, thus, on their profitability. By the end of 2010, the South African banking industry was made up of 19 registered banks, two mutual banks, 13 local branches of foreign banks, and 43 foreign banks with approved local representative offices (Department of Bank Supervision, 2010).

All four banks included in this study experienced considerable changes during the years, 1994 to 2010, for which we have data for our empirical analysis. The South African banks are under pressure to maintain their revenues in the competitive environment in which they operate. The banks make a significant amount of their incomes from noninterest income which is the bulk of the unsecured lending market. The current environment favours higher fees and commissions from these sources, especially when the interest rates are low, which puts pressure on their margins, when they are faced with increased costs for funding, bad debts increasing and high operational costs.

3. Empirical Models for Banking Efficiency

Because of the multiproduct nature of banks, there is no general agreement on defining bank inputs and outputs. Favero and Papi (1995) identify five approaches to input and output specifications, namely, the production approach, the intermediation approach, the asset approach, the user-cost approach and the value-added approach.

The production approach considers banks to be producers of loans and deposit accounts and measures output in terms of the number of loans and accounts produced and/or serviced (Cronje, 2002). According to Matthews and Zhang (2010) the production approach recognises that banks provide intermediation services and payments to depositors. According to Berger, Hanweck and Humphrey (1987), under the production approach, banks produce accounts of various sizes by processing deposits and loans, which incur capital and labour costs. Under this approach, operating costs are specified as inputs and the number of accounts is used as the output metric, while average account sizes are specified to control for other account characteristics.

Sealey and Lindley (1977) first identified the intermediation approach and stated that the main function of a bank is to conduct financial intermediation. In this approach, the bank's assets measure outputs and liabilities measure inputs (Matthews and Zhang, 2010). Cronje (2002) indicated that this approach views the activities of banks as borrowing funds from depositors and lending the funds to borrowers for profit. From this point of view, the banks' outputs comprise loans (indicated in monetary terms), and inputs comprise the various costs of these funds (e.g., interest expenses, labour, capital and operational costs).

According to Berger and Humphrey (1997), the asset, the user-cost, and the value-added approaches of assigning goods to input-and-output categories all agree that loans and other major assets of financial institutions should count as outputs. The asset approach is a variant of the intermediation approach and focuses on recent developments in the theory of intermediation. Outputs are strictly defined by assets and mainly by the production of loans, in which banks have advantages over other financial institutions (Favero and Papi, 1995). According to this approach, banks produce various loans and other investments as outputs from deposits, other funding sources, labour and materials (Cronje, 2002).

Favero and Papi (1995) state that the user-cost and the value-added approaches are not related to the macro-economic functions carried out by banks. Under the user-cost approach, the net contribution to bank revenue determines the nature of inputs and outputs (Cronje, 2002). Under the value-added approach, the identification of inputs or outputs is based on the share of value added. Items of the balance sheet with a substantial share of value added are considered as important outputs (Favero and Papi, 1995).

Resti (1997) indicates that a pivotal issue throughout the literature that is based on stock measures of banking products is the role of deposits. On the one hand, it is argued that they are an input in the production of loans (intermediation or asset approaches). Yet, other lines of reasoning (value-added or user-cost approaches) suggest that deposits themselves are an output, involving the creation of value added, for which the customers bear an opportunity-cost. According to Berger and Humphrey (1997), deposits have input characteristics because they are paid for in part by interest payments and the funds raised provide the institution with the raw material of investible finds. However, deposits also have output characteristics because they are associated with a substantial amount of liquidity, safekeeping, and payment services to depositors.

In this study, a variant of the intermediation approach is adopted and we initially specify a stochastic frontier production function model for the two individual output variables, interest income and noninterest income of the banks. The inputs

for the analysis of both types of incomes are labour, capital, operating costs, and deposits. Other variables included in our empirical analysis to explain the inefficiency of the generation of the interest and noninterest incomes of the banks are loans and investments (hereafter, loans & investments), interest expenses and financial capital.

We apply the SFA model, proposed by Battese and Coelli (1995), in which production functions for interest and noninterest incomes are specified by the translog functional form with random errors and nonnegative inefficiency effects, the latter being specified in terms of other observable variables that possibly influence the inefficiency of generation of the two sources of bank incomes.
The model for *interest income* is defined by:

$$Y_{1it} = \beta_0 + \sum_{j=1}^{4} \beta_j X_{jit} + 0.5 \sum_{j=1}^{4} \sum_{k=1}^{4} \beta_{jk} X_{jit} X_{kit} + \beta_5 t + V_{it} - U_{it} \qquad (1)$$

where Y_{1it} denotes the logarithm of *interest income* for the i^{th} bank (i=1,2,3,4) in year t (t=1,2, …, 17 for 1994, 1995, …, 2010, respectively)[1];

X_1 denotes the logarithm of *labour costs*;

X_2 denotes the logarithm of *capital costs* (land, buildings and other fixed assets);

X_3 denotes the logarithm of *operating costs*; and

X_4 denotes the logarithm of *deposits*;

The random errors (the $V_{it}s$) and the technical inefficiency effects (the $U_{it}s$) in the production function of equation (1) are assumed to be independently distributed for different banks and years, such that the $U_{it}s$ are independently distributed nonnegative random variables that are obtained by truncation (at zero) of normal distributions with respective means defined by

$$\mu_{it} = \delta_0 + \sum_{j=1}^{3} \delta_j Z_{jit} + \delta_4 t + \sum_{j=1}^{3} \delta_{0j} D_{jit} \qquad (2)$$

where Z_1 denotes the logarithm of *loans & investments*;

Z_2 denotes the logarithm of *interest costs*;

Z_3 denotes the logarithm of *financial capital* (ordinary shareholders' interest); and

D_j denotes the dummy variable for the j^{th} bank (j=1,2,3) that has value one if the observation is for the j^{th} bank and zero otherwise.

[1] Hereafter, the subscripts, *i* and *t*, are not included on all variables for simplicity of presentation.

We note that the translog production function for interest income in equation (1) accounts for neutral technical change in the generation of interest income over the years observed and the inefficiency model of equation (2) specifies that the inefficiency effects for the four banks may have different means and they may change over time. We do not account for non-neutral technical change in the production function nor do we consider that the Z-variables (loans & investments, interest income, and financial capital) may affect the inefficiency effects of the banks differently in their operations of generating interest income.

The model for *noninterest income* of the banks is assumed to be the same functional form as for interest income defined above. For noninterest income, the model is defined in terms of the logarithm of noninterest income, represented by Y_2 below.

We also consider the alternative approach of the output distance function for investigating the generation of the two sources of incomes for the banks. The translog *output-orientated distance function* for the case of M outputs and K inputs (see Coelli and Perelman, 1999. p. 130) is specified as

$$\ln D_{Oi} = \alpha_0 + \sum_{m=1}^{M} \alpha_m \ln Y_{mi} + 0.5 \sum_{m=1}^{M} \sum_{n=1}^{M} \alpha_{mn} \ln Y_{mi} \ln Y_{ni}$$

$$+ \sum_{k=1}^{K} \beta_k \ln X_{ki} + 0.5 \sum_{k=1}^{K} \sum_{l=1}^{K} \beta_{kl} \ln X_{ki} \ln X_{li} + \sum_{k=1}^{K} \sum_{m=1}^{M} \delta_{km} \ln X_{ki} \ln Y_{mi} \qquad (3)$$

where D_{Oit} is defined as the output distance for the i[th] firm (the smallest scalar by which outputs can be divided and the resulting outputs remain in the production set).

The restrictions required for the distance function to be homogeneous of degree one in outputs are defined by:

$$\sum_{m=1}^{M} \alpha_m = 1; \ \sum_{n=1}^{M} \alpha_{mn} = 0, \ m = 1, 2, ..., M; \ \sum_{m=1}^{M} \delta_{km} = 0., \ k = 1, 2, ..., K.$$

Using the symmetry restrictions, $\alpha_{mn} = \alpha_{nm}$, $\beta_{kl} = \beta_{lk}$, and the fact that the number of outputs in our model is M=2 and the number of inputs is K=4, the model to be estimated can be shown to be expressed by

$$\ln D_{Oi} - Y_{2i} = \alpha_0 + \alpha_1 Y_{1i}^* + 0.5\alpha_{11}(Y_{1i}^*)^2 + \sum_{k=1}^{4} \beta_k X_{ki} + 0.5 \sum_{k=1}^{4} \sum_{l=1}^{4} \beta_{kl} X_{ki} X_{li} + \sum_{k=1}^{4} \delta_{k1} X_{ki} Y_{1i}^*$$

where $Y_{1i}^* = Y_{1i} - Y_{2i}$.[2]

[2] Note that in the expressions after equation (3), and hereafter, the *X*- and *Y*-variables are defined in log terms, as in equations (1) and (2). However, equation (3) uses the notation of Coelli and Perelman (1999).

Introducing random errors in the translog output distance function, re-expressing terms and accounting for our case of having panel data, the model to be estimated is expressed by

$$-Y_{2it} = \alpha_0 + \alpha_1 Y_{1it}^* + 0.5\alpha_{11}(Y_{1it}^*)^2 + \sum_{k=1}^{4}\beta_k X_{ki} + 0.5\sum_{k=1}^{4}\sum_{l=1}^{4}\beta_{kl}X_{kit}X_{lit} + \sum_{k=1}^{4}\delta_{k1}X_{kit}Y_{1it}^* + V_{it} + U_{it} \quad (4)$$

where $U_{it} = -\ln D_{Oit}$ is a non-negative random variable associated with inefficiency of production and the V_{it} s are random errors that account for departure of the observations from the deterministic translog output distance function on the right-hand side of equation (4). The random errors are assumed to be independent and identically distributed normal with mean zero and constant variance, σ_V^2. These inefficiency effects are assumed to have the same distributional properties as those in the model of equations (1) and (2).

We test several null hypotheses of interest in our models using the generalized likelihood ratio statistic, defined by

$$\lambda = -2\{\ln[L(H_0)/L(H_1)]\} \quad (5)$$

where $L(H_0)$ is the value of the likelihood function under the restrictions of the null hypothesis, H_0, being tested; and $L(H_1)$ is the value of the likelihood function for the SFA model of equations (1) and (2) (see Coelli, 1995). Under H_0, the test statistic, λ, is asymptotically distributed as a central or non-central Chi-square with parameter equal to the difference between the numbers of parameters estimated under H_1 and H_0.

Interest income and noninterest income are the main income for banks and are therefore regarded as outputs in the production process. Interest income and noninterest income were specified as outputs in the models by inter alia, Charnes et al. (1990), Chen (1998), Howcroft and Ataullah (2006) and Matthews and Zhang (2010).

Labour and capital in some variant are applied as inputs in the production process. The user cost of capital can be used as capital input. These are the inputs that are needed in many production processes and were specified as inputs in the models by, inter alia, Sherman and Gold (1985), Elyasiani and Mehdian (1990, 1992), Berger and Humphrey (1991), English et al. (1993), Kaparakis, Miller and Noulas (1994), Favero and Papi (1995), Chen (1998), Stavarek (2002), Weill (2003), Casu and Girardone (2004), and Lin, Hu and Sung (2005), and Manlagñit (2011).

Operating expenditure, excluding labour costs, was specified as an input in the models by, inter alia, Charnes et al. (1990), Chen (1998), Stavarek (2002), Weill (2003), Howcroft and Ataullah (2006), Fung and Cheng (2010) and Matthews and Zhang (2010). Operating expenditure is an important item in the income statement of banks, being of the same magnitude as labour cost.

Deposits are regarded by some researchers as an input in the production process, while other researchers regard deposits as an output. In the intermediation process, deposits are used for lending purposes and was specified as one of the inputs in the models by, inter alia, Elyasiani and Mehdian (1990, 1992), English et al. (1993), Kaparakis, Miller and Noulas (1994), Chen (1998), Casu and Girardone (2004), and Lin, Hu and Sung (2005).

4. Data on South African Banks

Financial data on the four largest South African banks were obtained for the years 1994 to 2010 from the McGregor (2012) BFA database of listed companies' financial statements. The aggregate descriptive statistics for these data are presented in Table 1 for variables in original units, not in the logarithmic forms of the variables in the SFA model of equations (1) and (2).

It is evident that these variables show considerable variation over the 17 years for the four banks. A graph of the interest income and the noninterest income values for the four banks are given in Figures 1 and 2, respectively.

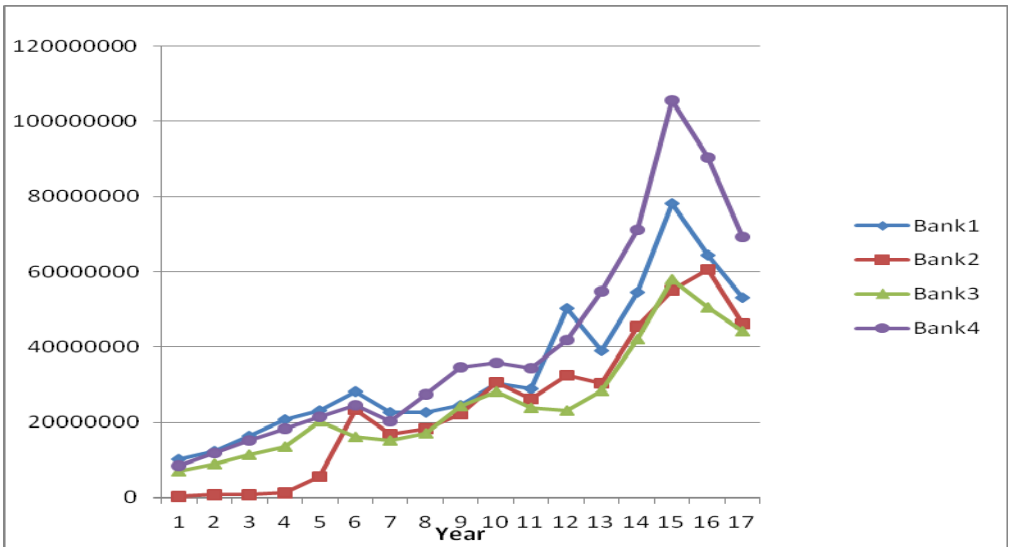
Table 1: Descriptive statistics for variables
for the four largest South African banks (R1,000)

Variable	Mean	Std dev	Minimum	Maximum
Interest income	31,087,070	21,660,533	374,250	105,589,000
Noninterest income	9,859,125	7,647,541	1,370,000	31,756,000
Labour costs	6,245,776	4,430,003	1,242,000	19,542,000
Capital costs	10,082,539	8,789,233	1,231,680	45,659,000
Operating costs	5,439,322	4,075,651	759,871	18,093,000
Deposits	256,443,356	193,776,375	3,567,576	843,815,000
Loans & investments	246,892,110	197,473,065	9,475,000	710,523,000
Interest costs	16,269,254	10,519,085	6,360	54,983,000
Financial capital	5,439,322	4,075,651	759,871	18,093,000

Source: Own calculation

Table 1 indicates that interest income is the dominant form of bank income relative to noninterest income, the latter being about one-quarter of the total of the two incomes. Of the first three input variables in our production function, on average, capital expenditures are the greatest, followed by labour expenses and operating costs, in order of magnitude. The size of deposits and loans & investments are of similar magnitude, as is seen from the averages and the standard deviations of these variables.

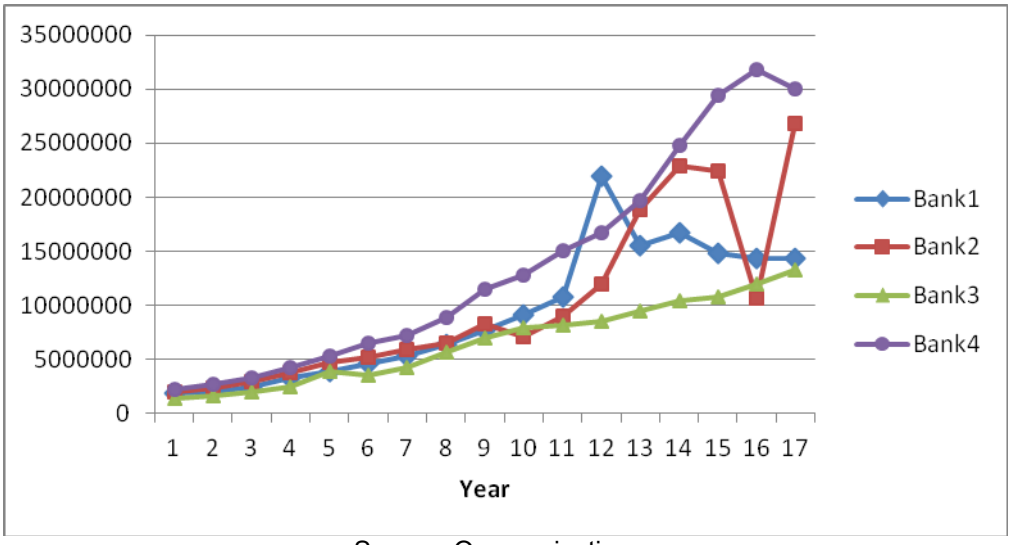
Figure 1: Interest Income of the Four South African Banks during 1994 to 2010 (Years 1 to 17).



Source: Own projection

The graphs of Figures 1 and 2 clearly indicate that the variability in the values of both types of bank incomes increased in amplitude over the years of the study, but especially in the last half of the sample period.

Figure 2: Noninterest Income of the Four South African Banks during 1994 to 2010 (Years 1 to 17).



Source: Own projection

5. Empirical Analysis

5.1: SFA Models for Interest and Noninterest Incomes

5.1.1 Tests of Hypotheses

We estimated the translog SFA model, defined by equations (1) and (2), together with various sub-models of interest for both interest and noninterest incomes of the banks. The empirical results were generated using mean-corrected data for the input variables so that the first-order coefficients of the input variables for the translog model can be interpreted as elasticities of the inputs at mean input levels. Before considering the empirical estimates obtained for the SFA models, we consider some tests of hypotheses about whether simpler models are adequate representations of the data, given the translog SFA production frontier model involved. These tests of hypotheses are presented in Table 2, together with the values of the loglikelihood function (LLF) for each SFA model that is estimated to obtain the values of the test statistic for testing the null hypotheses involved.

Table 2: Tests of hypotheses for SFA models for interest and noninterest incomes of the banks

Null Hypothesis	LLF	Test Statistic, λ	Critical Value[3]	Decision
Interest Income	45.6759			
H_0:$\gamma=\delta_0=\delta_1=\ldots=\delta_{03}=0$	32.4766	26.399	16.274	Reject H_0
H_0: $\beta_{jk}=0$, j, k=1,2,3,4	26.9263	37.499	18.307	Reject H_0
H_0: $\beta_4=\beta_{4kj}=0$, k=1,2,3,4	41.8103	7.731	11.071	Accept H_0
H_0: $\delta_1=\delta_2=\delta_3=0$	11.1665	61.288	15.507	Reject H_0
Noninterest Income	83.8484			
H_0:$\gamma=\delta_0=\delta_1=\ldots=\delta_{03}=0$	47.3905	72.916	16.274	Reject H_0
H_0: $\beta_{jk}=0$, j,k=1,2,3,4	50.4289	66.839	18.307	Reject H_0
H_0: $\beta_4=\beta_{4k}=0$, k=1,2,3,4	80.1925	7.448	11.071	Accept H_0
H_0: $\delta_1=\delta_2=\delta_3=0$	74.3230	11.739[4]	15.507	Accept H_0

Source: Own calculation

The first null hypothesis considered is that the inefficiency effects are not present. This hypothesis is strongly rejected for both interest income and noninterest income so that we conclude that ignoring the presence of inefficiency effects is not satisfactory for describing the relationship between the two sources of bank income

[3] All critical values given are the upper 5% points for the appropriate Chi-square distributions. The first is obtained from Table 1 of Kodde and Palm (1986) because the non-central Chi-square distribution is involved.

[4] This test statistic is obtained by comparing the TL3 model without the three Z-variables with the TL3 model with the Z-variables included. If the TL3 model without the three Z-variables is compared with the TL4 model with the Z-variables included, the test statistic is 19.051, which is also not significant at the 5% level.

and the various levels of input variables for the South African banks, given the specifications of the translog SFA model of equations (1) and (2).

The second null hypothesis considered in Table 2 is that the second-order coefficients of the translog production function for the income variables are all zero and so the Cobb-Douglas model would be an adequate representation of the data. This hypothesis is again strongly rejected for both interest income and noninterest income for the South African banks.

The third null hypothesis considered in Table 2 is that deposits do not have any significant effect on the levels of interest income and noninterest income of the four banks. This is specified in terms of the coefficients of the translog model of equation (1) having zero coefficients associated with the deposit input, X_4, namely, $\beta_4=\beta_{4k}=0$, k=1,2,3,4. For both interest income and noninterest income of the banks, this null hypothesis is accepted. The fact that deposits do not have a significant influence on both interest income and noninterest income of the banks is an important result that is discussed in more length in Section 6.

The fourth null hypothesis involved in Table 2 is that the coefficients of the three *Z*-variables in the inefficiency effects model of equation (2) for the translog production function (*with the three input variables, excluding deposits)* are simultaneously zero (H_0: $\delta_1=\delta_2=\delta_3=0$). This null hypothesis is rejected for interest income but accepted for noninterest income for the banks. The finding that loans & investments, interest costs and financial capital significantly affect the inefficiency of generation of interest income only is perhaps not surprising.

5.1.2 Estimated SFA Frontiers

The maximum-likelihood estimates for the first-order parameters of the production functions of the preferred SFA models for interest and noninterest incomes, together with the coefficients of the inefficiency model are presented in Table 3 for interest and noninterest incomes.[5] These estimates are obtained by using the FRONTIER 4.1 program, developed by Coelli (1992, 1996).

For interest income, the SFA model we prefer is the translog model without deposits but with all three inefficiency variables, together with the dummy variables to account for different mean inefficiencies for the four banks. This model for interest income also accounts for neutral technical change and technical inefficiency change over the years observed. This model for interest income has elasticity of labour of 0.57 at mean input levels but the elasticity of capital is estimated to be negative, but not significantly different from zero. There was significant technical progress for interest income for the banks over the 17 years of the study period.

The inefficiency effects in the generation of interest income are estimated to decrease as loans & investments and interest costs increase but to decrease as financial capital increases. The inefficiency effects tended to increase over the years of the study period, as shown by the positive estimate for the coefficient of year of observation. The inefficiency effects for interest income were significantly

[5] The estimates of the second-order coefficients of the translog SFA models are not given for brevity of presentation.

different for the four banks in the study, as expected. The γ-parameter, associated with the presence of inefficiencies in generating interest income, was highly significant.

Table 3: Maximum-likelihood estimates for the preferred SFA models for interest and noninterest incomes[6]

Variable	*Parameter*	*Interest Income*	*Noninterest Income*
Production function			
Labour	β_1	0.57 (0.24)	0.66 (0.21)
Capital costs	β_2	-0.090 (0.087)	-0.103 (0.052)
Operating Costs	β_3	0.14 (0.15)	-0.02 (0.17)
Deposits	β_4	0	0
Year	β_5	0.054 (0.020)	0.1039 (0.0071)
Inefficiency Model			
Constant	δ_0	5.6 (1.2)	-0.84 (0.15)
Loans & Investments	δ_1	-0.162 (0.069)	0
Interest Costs	δ_2	-0.434 (0.039)	0
Financial Capital	δ_3	0.24 (0.12)	0
Year	δ_4	0.061 (0.019)	0.059 (0.010)
Dummy for Bank 1	δ_{01}	0.65 (0.17)	0.28 (0.15)
Dummy for Bank 2	δ_{02}	0.66 (0.15)	0.25 (0.13)
Dummy for Bank 3	δ_{03}	0.71 (0.19)	0.57 (0.14)
	$\sigma_V^2 + \sigma_U^2 \equiv \sigma^2$	0.0186 (0.0052)	0.0277 (0.0058)
	$\gamma = \sigma_U^2 / \sigma^2$	0.439 (0.088)	1.0000 (0.0094)
	LLF	41.8103	74.3230

Source: Own calculation

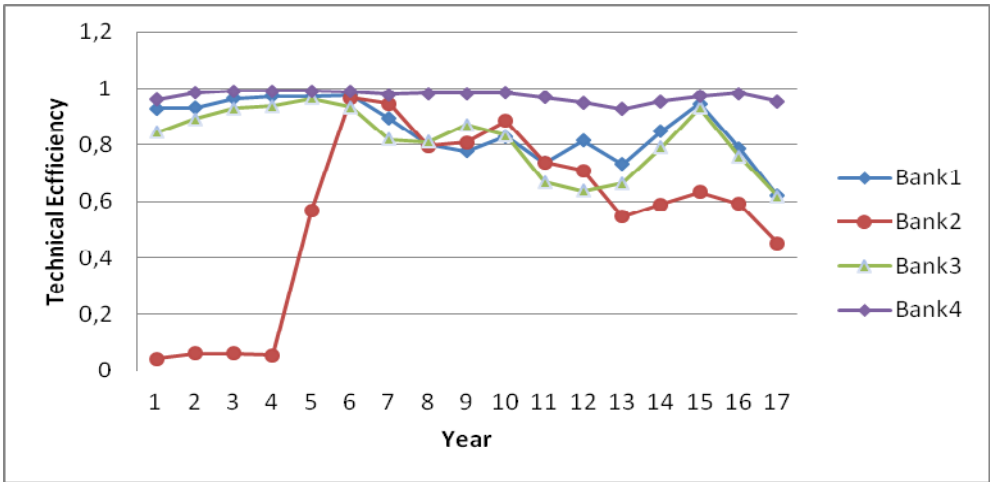
[6] The standard errors, correct to two-significant digits, are presented under the parameter estimates such that the latter are given to the same number of digits behind the decimal points as the corresponding standard errors.

The preferred SFA model for noninterest income is the translog model without deposits or the three Z-variables defined in equation (2) for explaining the inefficiency of generation of the noninterest incomes (loans & investments, interest costs and financial capital). The labour elasticity at the mean input values is estimated to be 0.66 but those for capital and operating expenses are estimated to be slightly negative[7] (but not significantly different from zero). There was significant technical progress in the level of noninterest income over the 17 years of the study, but there was also a significant increase in the level of technical inefficiency in the generation of noninterest income over time. The significance of the technical inefficiency effects in the generation of noninterest income is shown by the fact that the γ-parameter is estimated to be very close to one (equal to one, correct to four-digits behind the decimal point).

5.1.3 Technical Efficiencies

Using the preferred SFA models for interest income and noninterest income, presented in Table 3, the technical efficiencies of the banks generating interest and noninterest incomes for the 17 years of our sample period (1994-2010) are estimated using FRONTIER 4.1. These predicted values are graphed in Figures 3 and 4 for interest income and non-interest income, respectively.

Figure 3: Technical Efficiencies of Four South African Banks Generating Interest Income, 1994-2010 (Years 1 to 17).



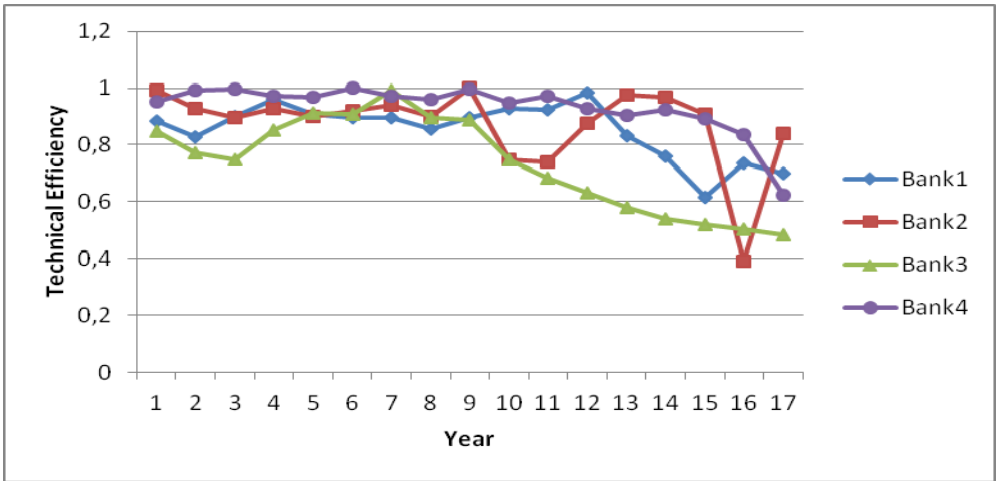
Source: Own projection

The mean technical efficiencies of generating interest income were estimated to be 0.854, 0.555, 0.817 and 0.972 for Banks 1, 2, 3 and 4, respectively, with the overall mean technical efficiency of 0.800. Bank 4 consistently had the largest technical

[7] These negative elasticities for the SFA model for noninterest income (and that for capital for interest income) indicate that the estimated translog SFA production functions do not satisfy the regularity conditions for production functions (see, e.g., Coelli, et al., 2005, p. 12). These are issues that merit future research.

efficiency of generating interest income of the four banks in every year of the sample period. However, it is evident from Figure 3 that Bank 2 had very low technical efficiencies in the first five years, but thereafter its technical efficiency was quite comparable with those of the other three banks until the last four years when it dropped to again have the lowest levels of technical efficiencies of generating interest income among the four banks.

Figure 4: Technical Efficiencies of Four South African Banks Generating Noninterest Income, 1994-2010 (Years 1 to 17).



Source: Own projection

The mean technical efficiencies of the four banks generating noninterest incomes were estimated to be 0.853, 0.873, 0.736 and 0.932 for Banks 1, 2, 3 and 4, respectively, with the overall mean technical efficiency of 0.848. Bank 4 was almost always the best performing bank for generating noninterest income but it is evident that its efficiency declined quite systematically in the last 10 years (since 2000) and dramatically declined in the last year to have the second lowest technical efficiency of the four banks. It is noted that Bank 2 had greater variability of its technical efficiencies in the last half of the sample period. Its technical efficiency dropped dramatically in 2009 but recovered in 2010 to be the highest of the four banks.

5.2: SFA Output Distance Function for Interest and Noninterest Incomes

We estimate the unrestricted translog output distance function with the two outputs and four outputs, defined by equation (4), together with the separable model without the interactions between the inputs and outputs. Before presenting the estimates obtained, we test some hypotheses about the output distance function and the results are given in Table 4.

Table 4: Tests of hypotheses for SFA translog output distance functions

Null Hypothesis	LLF	Test Statistic, λ	Critical Value	Decision
H_0:γ=δ_0=δ_1=…=δ_{03}=0	83.1824	41.486	7.045	Reject H_0
H_0: β_4=β_{4k}=δ_{41}=0, k=1,2,3,4	76.0496	55.752	12.592	Reject H_0
H_0: δ_{k1}=0, k=1,2,3,4	96.6755	14.500	9.488	Reject H_0
H_0: δ_1=δ_2=…= δ_{03}=0	84.8548	38.142	14.067	Reject H_0

Source: Own calculation

The first null hypothesis of Table 4, that there are no inefficiency effects in the unrestricted output distance function, is strongly rejected. The second null hypothesis is that the coefficients associated with deposits (X_4) in the output distance function have zero coefficients, so that deposits do not contribute to the explanation of the generation of interest or noninterest incomes, as found in the single output SFA approach in the earlier analysis. The results obtained by estimating the output distance function with the first three input variables (excluding deposits) yields a highly significant test statistic so we reject the null hypothesis that deposits are not relevant as an input variable for the generation of interest and noninterest incomes. The third null hypothesis of Table 4, that the separable output distance function is an adequate representation of the data (so that the coefficients of the interactions between the inputs and outputs in the output distance function of equation (4) are zero), is also strongly rejected. The fourth null hypothesis is that the coefficients of the explanatory variables in the inefficiency model (loans & expenses, interest costs, financial capital, year effect and three bank dummy variables) are zero. This null hypothesis is also rejected by the data. On the basis of the above tests of hypotheses, we judge that the unrestricted output distance function with the inefficiency variables is the preferred model. Estimates for the parameters of the unrestricted output distance function are given in Table 5, together with those for two submodels[8] that are estimated and tested for adequacy of fit, given the specifications of the output distance function model, defined by equation (4).

Table 5: Maximum-likelihood estimates for parameters in SFA output distance functions for banks generating interest and noninterest incomes[9]

Variables	Para-meters	Unrestricted	Separable	No Ineff Variables
Output Variables				
Constant	α_0	-16.299 (0.056)	-15.941 (0.065)	-16.28 (0.48)
$Y_1^* \equiv Y_1 - Y_2$	α_1	0.35	-0.31	0.29

[8] We do not present results for the output distance function with the three inputs excluding deposits in Table 5.

[9] The maximum-likelihood estimates of the output distance function are obtained by using the "cost function" option of FRONTIER 4.1 to account for the *addition* of the non-negative error, U_i, in the model of equation (4).

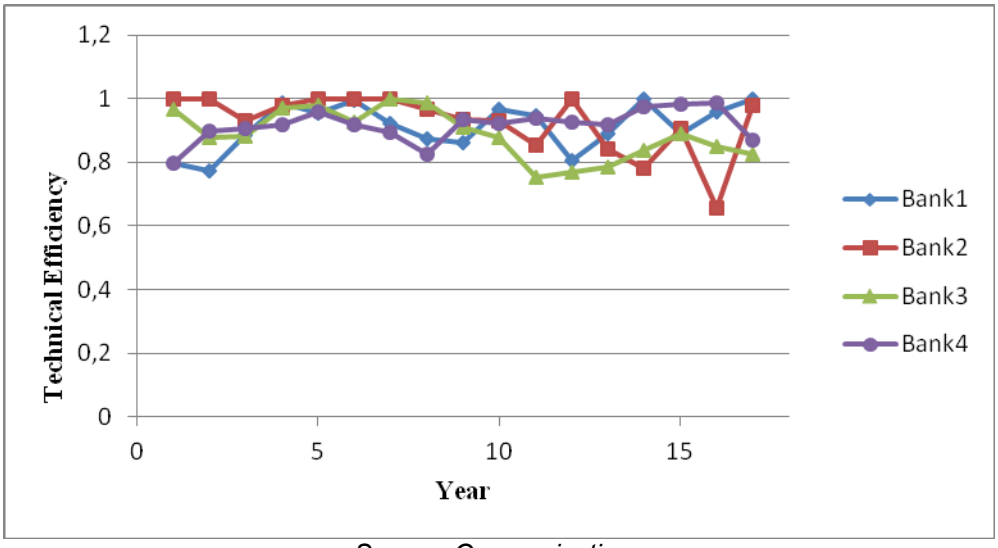
Variables	Para-meters	Unrestricted	Separable	No Ineff Variables
		(0.12)	(0.11)	(0.54)
$0.5(Y_1^*)^2$	α_{11}	-0.047 (0.096)	-0.85 (0.087)	0.01 (0.56)
Input Variables				
$X_1 \equiv \ln(Labour)$	β_1	0.18 (0.25)	-0.85 (0.12)	0.19 (0.67)
$X_2 \equiv \ln(Capital)$	β_2	0.20 (0.27)	0.032 (0.021)	0.06 (0.57)
$X_3 \equiv \ln(Expenses)$	β_3	-1.22 (0.35)	0.11 (0.11)	-1.12 (0.70)
$X_4 \equiv \ln(Deposits)$	β_4	-0.37 (0.40)	-0.964 (0.052)	-0.27 (0.87)
$(X_1)^2$	β_{11}	2.0 (1.1)	1.27 (0.67)	1.64 (0.97)
$(X_2)^2$	β_{22}	-0.21 (0.70)	0.23 (0.19)	-0.08 (0.90)
$(X_3)^2$	β_{33}	1.16 (0.29)	0.67 (0.69)	1.22 (0.87)
$(X_4)^2$	β_{44}	1.1 (1.3)	-3.95 (0.43)	1.19 (0.97)
$X_1 \times X_2$	β_{12}	-0.22 (0.65)	-0.14 (0.14)	-0.11 (0.78)
$X_1 \times X_3$	β_{13}	-1.9 (1.7)	-0.93 (0.63)	-1.75 (0.75)
$X_1 \times X_4$	β_{14}	1.2 (1.2)	0.84 (0.28)	1.28 (0.94)
$X_2 \times X_3$	β_{23}	0.69 (0.49)	-0.185 (0.092)	0.53 (0.82)
$X_2 \times X_4$	β_{24}	-0.86 (0.24)	0.73 (0.13)	-1.00 (0.89)
$X_3 \times X_4$	β_{34}	-0.40 (0.30)	-0.04 (0.49)	-0.40 (0.89)
Inputs×Outputs				
$X_1 \times Y_1^*$	δ_{11}	-0.69 (0.21)	0	-0.74 (0.66)
$X_2 \times Y_1^*$	δ_{21}	-0.17 (0.25)	0	-0.10 (0.48)
$X_3 \times Y_1^*$	δ_{31}	1.01 (0.14)	0	1.01 (0.51)
$X_4 \times Y_1^*$	δ_{41}	-0.52 (0.76)	0	-0.56 (0.84)
Inefficiency Model				
Constant	δ_0	-7.2	-1.8	0.02 (0.93)

Variables	Para-meters	Unrestricted	Separable	No Ineff Variables
		(2.1)	(1.1)	
Loans & Expenses	δ_1	-0.10 (0.21)	-0.210 (0.060)	0
Interest Costs	δ_2	-0.027 (0.022)	0.025 (0.034)	0
Financial Capital	δ_3	0.650 (0.085)	0.30 (0.10)	0
Year	δ_4	-0.0666 (0.0097)	0.037 (0.013)	0
Bank 1 Dummy	δ_{01}	0.08 (0.35)	0.26 (0.14)	0
Bank 2 Dummy	δ_{02}	0.07 (0.38)	0.005 (0.099)	0
Bank 3 Dummy	δ_{03}	0.43 (0.41)	0.59 (0.14)	0
Variance Parameters	$\sigma_V^2 + \sigma_U^2$	0.0135 (0.0037)	0.0308 (0.0040)	0.010 (0.035)
	$\gamma = \sigma_U^2 /$	0.99999 (0.00045)	0.999992 (0.000038)	0.89 (0.96)
Loglikelihood	LLF	103.9256	96.6755	84.8548

Source: Own calculation

The output distances obtained for the banks in the 17 years involved are graphed in Figure 5. These are interpreted as technical efficiencies of the generation of outputs (i.e., interest and noninterest incomes) of the banks involved. The mean technical efficiencies of the banks are estimated to be 0.913, 0.927, 0.887 and 0.916 for Banks 1, 2, 3 and 4, respectively, with average of 0.911. The yearly technical efficiencies varied by between about 5% and 10% for the four banks, with Bank 4 having the smallest variation (from about 0.799 to 0.988) and Bank 2 having the largest variation (varying from about 0.656 to 0.999 which were the minimum (in 2009, Year 16) and maximum technical efficiencies (in 2005, year 12). All four banks had technical efficiencies greater than 0.90 in more than one year, and over 60% of the yearly observations exceeded 0.90. These statistics indicate that there was a high level of technical efficiency in the generation of income by the four banks according to the inference from the output distance function involving the two outputs of interest and noninterest incomes. In general, the output distance function technical efficiencies for the banks are greater than those obtained by the analysis involving interest income and noninterest income separately.

Figure 5: Output Distances for Four South African Banks Generating Interest and Noninterest Incomes during 1994 to 2010 (Years 1 to 17).



Source: Own projection

6. Discussion of results

The South African banking sector experienced considerable changes during the years, 1994 to 2010. Over the last decade, the banks saw the first substantial rewrite of the Banks' Act and Regulations since 1990, after the adoption of the international guidelines, called Basel II, which took effect on 1 January, 2008. Banks also saw the introduction of the National Credit Act, as well as the Financial Sector Charter. These changes affected the profitability of the banks and forced them to rethink their marketing strategies. The banks became more services driven and, to a large extent, not primarily interest-rate driven.

Tests of four null hypotheses were considered for the SFA model, defined in equations (1) and (2), for interest and noninterest incomes considered separately, to see if simpler models were adequate representations of the data on income variables for the four banks. The first two null hypotheses considered were strongly rejected for both interest income and noninterest income, indicating that there were significant inefficiencies in the generation of both types of incomes by the banks and that there were not constant elasticities associated with the inputs, labour, capital and operating costs (as specified by the Cobb-Douglas production function).

The third null hypothesis that deposits do not have any effect on the levels of interest income and noninterest income was accepted. We know that deposits only have an influence on interest income once they become available as loans. Interest income is related to interest rate changes. Short-term deposits and bank accounts are volatile deposits and so they are not utilized as loans and make no contribution to interest income. Longer-term deposits and purchased funds are typically the liability accounts that are utilized as loans. The more stable a deposit, the higher the percentage of the deposit that can be made available as loans. With

regard to noninterest income, many depositors open bank accounts to reap the benefits they receive from being a bank client. With a large unbanked society, banks attempt to deliver services to these people and various initiatives are used to minimise the cost of holding an account (e.g., keeping a specific minimum balance to pay a minimal service fee). In some cases, banks charge a fixed amount for services rendered, but set a maximum number of services that can be used (e.g., cheques and Internet banking) within a specific period such as a month. In such cases, clients attempt to stay within these margins. However, with a larger number of bank clients, it is expected that there would be an increase in the total amount of noninterest income.

Loans & investments, interest costs and financial capital significantly affect the inefficiency of generation of interest income but not the noninterest incomes of the banks. In South Africa, the prime overdraft rate is 3.5 percentage points higher than the Repo rate set by the Reserve Bank of South Africa. Banks set their own interest rates for their clients, depending on the status of the client and in line with the prevailing interest rates. Because banks, to a large extent, face similar costs of funds, the competition between banks is not interest-rate driven but rather services driven. Although a bank may not be very successful competing on interest income, it may be successful in generating noninterest income (by its service fees). Some banks have even offered new clients an iPad at a discount if they switch banks. The marketing of banks is focused on the various services offered (e.g., one-stop banking). Financial capital is not used to make loans, but is used to finance banking activities. Although the amount of financial capital may increase over time, it does not necessarily mean that the bank will be able to increase its income and, hence, its profits. Financial capital is used to absorb losses that are generated by all types of risks, and is a hedge against solvency risk.

The alternative analysis of interest income and noninterest income using an output distance function approach yielded some different results than the single output analysis with the incomes separately. Again, we find significant inefficiencies in the generation of the outputs, interest and noninterest incomes, using an SFA model in which the distance function is associated with the explanatory variables, loans & investments, operating costs and financial capital. It was concluded that deposits, along with labour, capital and other operating costs, are significant in the output distance function associated with the two outputs and inputs. The technical efficiencies obtained by the use of the output distance function were found to be very high for all four banks, ranging from about 0.69 to 0.99, the average being 0.884, and the mean technical efficiencies for the four banks ranging from 0.81 to 0.96. In general, these technical efficiencies obtained from the output distance function were greater than those obtained for the corresponding banks using the SFA models involving interest and noninterest incomes separately.

Results from alternative methods of estimation of the SFA production function models would be helpful to confirm the results obtained in our study involving the maximum-likelihood approach.

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HOW FOREIGN PARTICIPATION IMPACT COMPANIES' PERFORMANCE: EMPIRICAL EVIDENCE FROM ROMANIA

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Abstract: Romania, as other emerging countries, was caught in the "euphoria" of foreign capital as main engine of growth. The economic growth registered from 2003 to 2008 has been put on account of foreign capital. In theory, the perception on FDI role in development process is mixed, proceeding alternatively from an optimist approach to a pessimist one, and arriving recently to a more nuanced understanding of FDI impact. The empirical studies realized on CEECs samples found, at their best, a FDI contribution through capital accumulation, while technological transfer through FDI does not constitute a valid channel for economic growth. A descriptive and empirical analysis is performed over a sample of 96 firms from Romania, observed between 2003 and 2008. The paper's aim is to investigate the role of foreign investment in improving the performances of firms in Romania. The results show that foreign investment has a neutral impact for the production/ productivity of the firm, a positive one being conditioned by R&D investments of the firm. The implications of our findings in terms of public policies are drawn at the end.

JEL classification: F21, F23, F43

Keywords*:* FDI, CEECs, economic growth, firms' production and productivity, panel econometrics

1. Introduction

In the post-communist era, Romania experienced an anfractuous trend in terms of GDP growth. After negative growth rates in the first period, it has to pass a decade to have a trend of continuous growth in Romania. The slow transition in Romania accompanied by low economic performances, do not created an attractive

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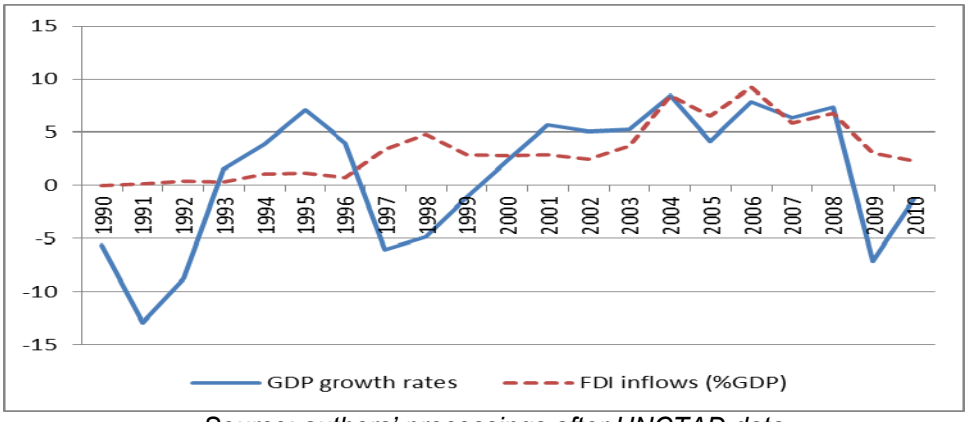
environment for foreign investors. The situation changed after 2000 when the economy started to perform better and foreign capital increased. In 2008, FDI stock represented approximately 68 billions USD of which more than 60 billions USD was attracted only during 2003-2008. After 2003, Romania entered in a new stage when locational advantages developed and large FDI were recorded. In the same period, unprecedented growth rates were registered in the economy (a yearly average of 6%). This trend was interrupted in the last years by the global economic crisis that disturbed foreign capital flows and national economies performances.

A quick view on FDI inflows and GDP growth rates in Romania (see Figure 1) reveal that, the two indicators evolved in the same manner from 2003 to 2008, highlighting a possible connection between the two. The government and some specialists explained the economic growth of that period, almost exclusively, by foreign capital inflows. Though, as plausible as this hypothesis is the one assuming that we were witnessing a similar evolution in FDI and growth trend without the two being correlated.

As we found the causal relationship invoked by policy makers not sufficiently grounded, we focus our analyses especially on that period (2003-2008). We appreciate that investigating the nature of the relationship "FDI – growth" in a "boom" period, it is of a great importance for the macroeconomic policy in Romania. If a causal relationship from FDI to growth is found, then the policymakers were right in supporting through different incentivies the foreign capital entrance. If there is no connection, then policymakers should have sustained the domestic firms instead of foreign ones. Our result is especially of a great importance in our days marked by crises, when the economy should be relaunched and the capital scarcity in the domestic economy raises once again the question of foreign capital efficiency.

Figure 1: FDI inflows and GDP growth rates in Romania, 1990-2010



Source: authors' processings after UNCTAD data

Some intuitive arguments, coming to support or contradict the thesis of positive impact of foreign participation in share capital, are presented below.

In an optimistic view, FDI could be economic growth enhancing in the host country through many channels. Firstly, FDI could stimulate economic growth through capital accumulation. Secondly, FDI could be the source of technological progress and also the way to improve labor productivity.

On the other hand, the FDI non-enhancing growth arguments are based on the risk of side effects of various advantages especially created for foreign investors, the risk of local producer bankruptcy, the risk of excesive extension of multinationals market power, and the risk of profits repatriation instead of local investments. Foreign investments are characterized by tight controls on the transfer of technological and managerial competences and on the export channels and that reduce the positive externalities in the host country.The very highly qualified workers benefit from capital intensive technology transferred by the foreign investors, while the rest of the workers are excluded in a rigid labor market. In particular, the bigger the human capital endowment in the host country, the bigger the benefits from technology transfer initiated by foreign subsidiaries in favor of national firms.

Preferring a microeconomic approach in our study, we aim to investigate the role of foreign investment in improving economic performances of a sample of 96 firms listed on the Bucharest Stock Exchange in Romania. The period of study is 2003-2008, the period characterized by a boom in FDI, and by an unprecedented economic progress for the Romanian economy. The results will bring additional enlightements on FDI micro-effects in Romania.

The article is structured as follows: Section 2 is a summary of theoretical and empirical contributions on the relationship FDI-economic development; Section 3 introduces our empirical analysis over the chosen sample of firms from Romania; and Section 4 presents the main findings, outlining the implications in terms of public policies, too.

2. Literature Review

Theoretical contributions follow either a macroeconomic approach postulating the relationship between FDI and economic growth, or a microeconomic approach, that is showing a link between the foreign participation to share capital and the production / productivity of the company. The essence is the same, only the level where is addressed the issue is different. Similarly, empirical studies examine this relationship on one of the two levels - macro and microeconomic.

The theory of economic growth based on FDI was developped in connection with Solow's neoclassical model in 1950-1960, dependency theory in 1970, than endogenous growth theory in 1980-1990 (Romer, 1986), Aitken and Harrison's model during the second half of 20th century and finally Leahy and Neary's contribution in 2007. In that framework, the view on FDI role in development process changed, proceeding alternatively from an optimist approach to a pessimist one, and arriving recently to a more nuanced understanding of FDI impact.

The FDI are systematic introduced in the investments-growth models. Growth promotion factors have been considered succesively: savings and investments (clasical models), technical progress (neoclassical models), respectively research and development (R&D), human capital, capital accumulation, externalities (in the new growth theory) (Moudatsou, 2001).

In Solow's short-run economic growth model (Solow, 1956), the FDI role is to contribute to capital accumulation. Though, the impact of FDI on the growth rate is restricted by the existence of diminishing returns on the physical capital. As a result, the FDI impact the production per capita and not the growth rate (Bengoa-

Calvo and Sanchez-Robles, 2003). The technology is considered exogenous and that implies that the model do not allow for a country to improve the new technologies production rate and catch up. This shortcoming of the Solow model is criticized and corrected by endogenous growth rate partisans (Graham and Wada, 2001).

Dependency theory, resulting from the pessimists thoughts, asserts the negative effect of foreign investments coming from developed countries on the developing countries long-run economic growth. Some unwellcome effects are highlited: local labor force exploiting, low price paid for raw materials, and the increase of revenue inequality. Among the partisans of those thoughts were Karl Marx, Paul Baran, and Andre Gunder Frank. The theory was the most popular in the 1970, offering to the nations the arguments and methods in order to restrict the foreign capital. Among these countries, East Asia and Latin America countries are mentioned, which adopted an import substituting FDI strategy. Though, that policy proved to be a failure for these countries, being shortly replaced with a liberal politics of foreign investments attraction. Neverthelles, the pesimist ideas have not been entirely abandoned and that because some FDI perverse effects are observed nowadays in the host country.

In the endogenous growth theories, the FDI role is to diffuse the advanced technology from the developed countries to developing ones (Buckley, 2002).

In the Romer's long-run economic growth model (1986), knowledge acts like any input, and technological changes are considered endogenous. In contrast with models based on diminishing returns (see Solow's model), in Romer's model the economic growth rates are increasing over time. The knowledge available to a firm (depending on the knowledge stock in the economy) determines the production and long-run economic growth. A nation suffer from an "idea gap" if the knowledge are insufficient. In the Romer's view (1993), FDI favour the gap overtaking through the know-how transfer and productivity rise effect. Romer introduces FDI in an endogenous economic growth model, where the growth results directly from physical capital investments which at their turn are the result of R&D investments. Romer considers that the creation of goods incorporating advanced technology depends of human capital stock and its growth. In that way, the firms operating in countries with an important and skilled human capital can innovate more rapidly and enjoy the technical progress and productivity increasing. In the absence of an appropriate human capital, the FDI attraction is the solution for enhancing economic growth, because it makes possible the know-how transfer.

More recently, the model belonging to Aitken and Harrison (1997) accentuates the foreign presence negative effect on the local companies' productivity. In fact, there are two contrary effects whose net result is negative. On one hand, domestic firms could beneficiate from the foreign firms' presence through many channels: (i) human capital accumulates knowledge inside foreign firms and valorizes them inside local firms, contributing to productivity rise; (ii) domestic firms beneficiate of externalities being in touch with foreign firms' new products and marketing techniques, or receiving technical support from it; (iii) domestic firms being inputs suppliers for foreign firms, beneficiate from employees experience in the foreign firm. On the other hand, foreign presence could reduce national firms' productivity, especially in the short-run. The foreign company, with lower marginal costs is encouraged to raise its production comparative to its national

competitor. As long as both companies produce for the local market, the demand for the domestic companies' products reduced. Their productions as well its productivity diminish. If this second effect is sufficiently high, the net effect of FDI becomes negative. In conclusion, according to these theoreticians, FDI do not improve domestic firm performances.

One important contribution belongs to Leahy and Neary (2007), inspired by the numerous empirical studies that supported the idea that R&D improves the absorption capacity of a company (ability to internalize the externalities derived from other companies) and directly contributes in raising its performances. Leahy and Neary develop a theoretical model for the absorption capacity which is defined as the ratio between its disposable knowledge, deriving from opponent companies, and the actual knowledge level in economy. The authors show a decrease of effective externalities as a result of difficulties in knowledge absorption from concurrent. In the light of this contribution, FDI are presented as always generating the productivity increase in the direct investment firm, while the host country productivity rise is conditioned by an externalization degree sufficiently high. The internalization of knowledge in the host country is easier in the R&D intensives sectors or in the firms disposing of a sufficient stock of knowledge to start.

A more dynamic approach is that belonging to Dunning and Narula which introduced the theory of Investment Development Path (IDP). IDP theory (Dunning, 1981) postulates the existence of a link between the level of development of a country (GDP per capita) and its net investment position that is determined as the difference between capital outflows and inflows of foreign capital. The hypothesis that stands behind the theory: as a country develops the conditions for domestic and foreign firms are changing, affecting the inflows and outflows of capital; in turn, FDI have an impact on economic structure, leading to dynamic interdependence between these two. According to the IDP theory, as the economy develops, the capital inflows increase, then decrease for increasing capital outflows instead.

As the theoretical contributions, the empirical ones are split, the results varying according to analyzed countries or periods, and the methodologies used.

The empirical analyses which identify a FDI-growth positive correlation explain FDI role through its contribution to capital accumulation (in the Solow theory spirit), others underline knowledge transfers that FDI facilitate (in the Romer theory spirit), and finally, there are studies that evidentiate the FDI dual character.

The studies realized on CEECs (Central and Eastern European countries) samples find, at their best, that FDI contribute to capital accumulation and in that specific way to growth. The results show, in general, the absence of complementarity between foreign investment and domestic one, or identify negative externalities for local firms that reduce its production. Technological transfer through FDI does not constitute a valid channel for economic growth in host country, as long as the beneficiaries from this transfer are at most the firms with foreign participation. Damijan et al (2003) confirm that technological transfers associated to FDI in eight CEECs, constitute a channel for growth only for foreign firms.

A more nuanced approach explains the absence of technological transfers through an extremely poor absorption capacity in the domestic firms and in the whole economy. This hypothesis was verified successively for samples of developing countries, Asiatic countries, Latin America, China, Pakistan, but lesser for transition countries.

An important set of empirical contributions on FDI-economic growth relationship identify some "social capacity" elements whose presence make a country to benefit from FDI in terms of economic growth. These conditions concern in particular an appropriate human capital (Borensztein, De Gregorio and Lee (1998), (2009), Konings (2001)).

Results are varying from a macro-level approach to a micro-level approach. Generally, microeconomic empirical studies are those who do not identify strong links between FDI and economic growth. Even more, there are some micro-level studies that bring empirical evidence for a negative influence of FDI stocks upon economic growth. In our opinion, micro-level studies display more realistic results, while macro-level studies suffer from aggregation of data.

Hanousek et al. (2010) summarizes in their paper the broad range of empirical results on the direct effects and spillover effects of FDI drawn from 21 studies focusing on transition countries. Using meta-analysis, the authors found that the research design (definition of firm performance and foreign firm presence) is crucial for a proper analysis and also, there may be a publication bias. They evidentiate that FDI effects are weekening over time due to more sophisticated methods and more controls that can be used once a sufficient time span available. Summarizing, the authors show that studies accounting for specific spillover channels (absorption capacity, R&D, education, institutions) do not report evidence of knowledge spillovers from FDI. In contrast, the importance of backward and forward linkages in producing spillovers is strongly acknowledged.

A set of empirical studies are synthesised in the Appendix.

3. Role of Foreign Investment in the Companies from Romania

Panel under analysis is composed of a sample of 96 firms from Romania, of which 56 firms are domestic owned (minimum 90% of ownership rights), 29 companies are foreign owned (minimum 10% of ownership rights) and 11 companies have been foreign owned, but also domestic owned, during specific subperiods in the analyzed period. We choose to process data at the microeconomic level as we belive that macroeconomic statistics suffer from aggregation leading to less reliable results. In sampling, we targeted those companies listed on the Bucharest Stock Exchange. From our sample, 49 companies are contained in BSE Section (Class I - 16 companies and category II - 33 firms), and 47 companies in Rasdaq Section (category III). Being listed on the BSE, the companies from the sample meet a series of economic and financial performances criteria. During the analyzed period, selected companies were characterized by a significant increase of stock price and an important market capitalization and transactions volume on the Bucharest Stock Exchange.

Data sources are annual financial statements of the companies from the sample, available through the website of BSE and Filezilla program. This program enables the provision of financial reports (quarterly, biannual, annual) of companies listed only on BSE market.

Target horizon in our study, covers the period 2003-2008 in which Romania has benefited from substantial inflows of foreign capital and an unprecedented growth. Our goal is to determine whether or not there is a connection between the two phenomenons: the entry of foreign investors and economic progress.

Specifically, we investigate the role of foreign investment in improving the performances of firms in Romania. Two issues are of interest here: (i) to identify the impact of foreign participation on the production and productivity of foreign company, and (ii) to verify the existence of positive externalities in the companies with domestic capital.

3.1. Model and Methodology

Following the line developed by Aitken and Harrison (1999), we estimate a log-linear production function at firm level, where the company's production volume is explained by two factors of production (capital and labor) to which the foreign participation variable is added. The variables are converted to the logarithmic form (except for foreign participation) to allow a linear specification instead of the traditional function of Cobb-Douglas.

Empirical specification, in expanded form, is presented as follows:

$$PROD_{ijt} = c_0 + c_1 CAP_{ijt} + c_2 LAB_{ijt} + c_3 MAT_{ijt} + c_4 RD_{ijt} + c_5 FI_{ijt} + c_6 FP_{jt} + c_7 FI\_FP_{ijt} + c_8 RD\_FI_{ijt} + c_9 RD\_FP_{ijt} + c_{10} DUM\_YEAR + c_{11} DUM\_SECT + e_{ijt} \quad (1)$$

Variables considered are presented below:

$PROD_{ijt}$ is the endogenous variable representing the production volume of firm i from the sector j at time t (t = 2003 ,..., 2008). Net turnover is expressed in millions RON, converted to logarithmic form.

The next two variables are proxies for inputs in the production function.

CAP_{ijt} is the capital of the company, proxied by fixed assets. Fixed assets are preferred instead equity, because they represent the productive capital. Fixed assets are expressed in million RON, converted to logarithmic form. LAB_{ijt} is the number of employees of the company i, from sector j at time t (in logarithmic form).

We add two more factors in production function, respectively material cost of the company and research and development expenses.

MAT_{ijt} are the current assets of company i, from sector j, at time t, expressed initially in million RON, but converted to logarithmic form. Using inventories[1] in the first stage, do not lead to consistent significant results. To replace them with current assets[2], slightly improves the quality of regression and the coefficient remains significant as we add new variables. RD_{ijt} are the intangible assets of company i, from sector j, at time t, expressed initially in million RON, but converted to logarithmic form. Variable is chosen as a proxy for the investment of the company in research and development, which is expected to improve the ability to internalize the knowledge transferred by foreign investors.

[1] Inventories comprise raw materials and consumables, production in progress, finished goods and merchandise, prepaid expenses of inventories.

[2] Current assets include inventories and receivables, short-term investments, cash from the bank and the cashier

The next two variables are proxies for the presence of foreign investment at the company level, respectively at the sector level.

FI_{ijt} is foreign investment in company's equity, ranging from 0 to 100%. If foreign participation in a company improves the production or productivity, then the coefficient of this variable is positive and significant.

FP_{jt} is a proxy for foreign presence in sector j, at time t, measuring the externalities of technological type in the sector j, deriving from foreign investors. Like Konings (2001), we calculate the variable as the share of foreign firms' production in total production of sector j in which they operate[3]. If there are positive externalities from foreign firms to national firms, then the coefficient of this variable must be positive and significant.

A number of interactive variables are added to the specification.

From the interaction between FI_{ijt} and FP_{jt} variables, results the FI_FP_{ijt} interactive variable that is used to determine whether the effects of foreign presence on other foreign companies are different from the effects on national firms. If foreign firms benefit from the presence of other foreign firms, the coefficient is positive.

The variables RD_FI_{ijt} and RD_FP_{ijt} are the result of interaction between RD_{ijt} and FI_{ijt}, respectively FP_{jt} variables. If we find a positive interaction, then we can say that companies which are investing in research and development can benefit from positive externalities deriving from foreign presence at the firm or sectoral level.

Dummy variables are introduced for each year separately, to capture specific factors of the respective year, other than inputs and foreign presence that influenced the level of production (management changes or economic context, for example).

Other dummy variables concerne each sector of activity. It allows isolating the effect of specific sector productivity over the production / productivity of firm. In this way, we can control differences from one sector to another in terms of productivity, which could influence the level of foreign investment in specific sectors. If foreign investors are concentrated in the most productive sectors, then the observed correlation between foreign presence and productivity of domestic firms are likely to overestimate the positive impact of FDI. Resorting to those sector-dummy variables will solve that specific problem.

The estimates were carried out after the panel techniques, by using the WinRATS software. The estimate method is the GLS, in a model with random individual effects. We prefer random effects panel techniques for at least three reasons: (1) the panel is preferred compared to the „cross-country race" analysis when having a relative small sample (96 companies); it brings more robustness to the results because it also exploits the temporal dimension of the data (6 years); (2) it is appreciated that there exist consistent and specific individual effects that are not observed, which influence the endogenous variable beyond the selected exogenous variables (the individual effects are preferred to the pool); (3) it is supposed that the individual effects are random (the random effects are preferred to the fixed effects, even if the results under fixed effects methodology do not differ significantly from those under random effects).

[3] Calculations are made on sectoral classification of NACE code with 2 digits.

Each company in the sample present specific characteristics, so the integration of individual effects within the model as a heterogeneous dimension, is mandatory. Individual effects are captured by specific constants for each individual of the panel. A model with individual effects is presented as follows:

$$y_{it} = \alpha_i + \beta x_{it} + \varepsilon_{it} \ , i \in [1, N], t \in [1, T], \ N \ individuals, T \ periods$$

The equal coefficient β hypothesis $\beta_i = \beta, i \in [1, N]$ is accepted, but the common constant α hypothesis is rejected for all individuals. In a random effect model, the residuals' structure is the following: $\varepsilon_{it} = \alpha_i + \lambda_t + v_{it}$, where α_i stands for the random individual effects (the structural or out of time specificities for each individual), λ_t stands for the temporal effects (factors that identically influence the individuals' sample, but the factors vary with time), and v_{it} stands for the factors that influence the endogenous variable differently with time and from one individual to another. ε_{it} is independent and identically-distributed. The BLUE estimator is the GLS estimator. Furthermore, we may say that the random effect model is an intermediary specification between the no individual effect model and the fixed effect model. The hypothesis for a common distribution of the individual effects permits considering a structure that is neither totally homogenous, nor totally heterogeneous (see also Sevestre, 2002).

3.2. Results

The results of regressions are summarized in the tables below. Regressions are performed one by one, over the entire sample, but also on sub-groups consisting of companies with domestic capital, and those with foreign ownership.

In a first stage, we consider all the 96 companies to empirically verify the hypothesis of the correlation between foreign investment and production, respectively the productivity of the company.

Table 1: The Impact of FDI on the Firms Production in Romania, 2003-2008

The independent variable	(1)	(2)	(3)
Constant	3.90*** (0.00)	3.81*** (0.00)	4.44*** (0.00)
FI	0.38*** (0.00)	0.11 (0.64)	0.11 (0.78)
FP		0.43*** (0.00)	0.30* (0.09)
FI_FP			-0.28 (0.60)
DUM_YEAR	x	x	x
DUM_SECT			x
Obs	*450*	*446*	*446*
R2 centered	*0.94*	*0.94*	*0.94*

Note: In parentheses are p-values. *** Means significant coefficients 1%, ** significant 5% and * significant 10%. Estimates were made after the specific techniques of the panel using WinRATS. Regressions imply the existence of random individual effects; GLS is the method to estimate the coefficients. Total number of observations is 576 (96 observed firms over the six years).

The specification that excludes inputs (capital, labor, etc.) allows the evaluation of the FDI'impact on the production of firms in the sample. Explanatory power of specifications is high (centered R^2 is 0.94), however lower than for regressions which include the inputs. The result on the relationship between foreign participation and production it is not a robust one, sinci it lose its significance in regressions (2) and (3). However, foreign presence at sectoral level positively influences the production of companies. More, in this stage, our results show that the effects induced by foreign presence in the sector are similar for foreign firms, as for domestic ones (the coefficient of FI_FP variable is not significant).

Still, this specification is not in agreement with a standard production function which includes inputs (according to Cobb-Douglas function). Once the inputs introduced the impact of FDI becomes valuable on the *productivity* level of firms.

Table 2: The Impact of FDI on the Firms Productivity in Romania, 2003-2008

The independent variable	(4)	(5)	(6)	(7)	(8)	(9)
Constant	-1.13***	-0.62***	-0.88***	-1.35***	-2.24***	-2.57***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CAP	0.48***	0.21***	0.22***	0.16***	0.13***	0.16***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LAB	0.56***	0.42***	0.46***	0.58***	0.68***	0.74***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
MAT		0.40***	0.37***	0.30***	0.26***	0.20***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
FI			0.22	-0.01	0.12	0.17
			(0.10)	(0.91)	(0.64)	(0.55)
FP				0.34***	0.28**	0.29**
				(0.00)	(0.02)	(0.03)
FI_FP					-0.37	-0.48
					(0.33)	(0.27)
RD						-0.003
						(0.78)
RD_FI						0.02
						(0.40)
DUM_YEAR				x	x	x
DUM_SECT					x	x
Obs	*569*	*569*	*448*	*444*	*444*	*361*
R2 centered	*0.96*	*0.96*	*0.96*	*0.96*	*0.97*	*0.97*

Note: In parentheses are p-values. *** Means significant coefficients 1%, ** significant 5% and * significant 10%. Estimates were made after the specific techniques of the panel using WinRATS. Regressions imply the existence of random individual effects; GLS is the method to estimate the coefficients. Total number of observations is 576 (96 observed firms over the six years).

These specifications are characterized by a high explanatory power and highly significant degree of the coefficients of inputs variables. The estimates give plausible elasticities for capital (0.16) and labor (0.74), consistent with the distribution

of added value for a Cobb-Douglas production function. Among other factors included in the model, current assets variable is found significant, but intangible asstes insignificant. This last result is explained by the fact that firms in Romania do not invest enough in research and development; even companies with foreign participation did not always support innovation. More, foreign investor may be reluctant sometimes to transmit knowledge to the company in which he invests.

In our sample, maximum values of intangible assets are recorded for the following companies: Transelectrica (TEL) of firms with domestic capital and Petrom (SNP) of firms with foreign capital. However, the size of intangible assets in these companies is far from reaching the values recorded in companies from the same business sectors abroad[4]. For comparison with Transelectrica were considered companies like Endesa SA (Spain) and Electricité de France (France), both recording higher values of intangible assets (about 3.1, respectively 6.8 billion RON compared with 1.5 billion RON by TEL in 2005). Petrom's intangible assets fall well below the values recorded by companies from the same sector aboard: 1.1 billion RON in 2008 compared by 2.9 billion RON at OMV of Austria or a 2.5 billion RON in Maurel et Prom SA France.

Therefore, production in Romania is not innovation based, but rather traditional factors fundamented. Moreover, the limited R&D investment in Romanian firms reduces the possibilities to benefit from externalities arising from foreign ownership, such as the transfer of knowledge and know-how. The low absorbtion capacity of knowledge in the companies from Romania explains the insignificance of the coefficient of RD_FI interactive variable.

The result on the coefficient of foreign ownership is not a robust one. Therefore, the productivity of firms in Romania was not affected, during the analyzed period, by foreign participation to capital. It is an important result, which is interpreted as a neutral impact of foreign investment, neither favorable, nor unfavorable to business productivity.

As for the variable of foreign presence at the sectoral level, it appears to be significant in explaining the productivity of firms in Romania. The coefficient is positive, so we conclude that the companies operating in sectors with a large foreign presence are more productive than those which interact less with foreign companies. The variable coefficient in regression (7) corespondes to an overstated externality; this shortcoming is corrected in regressions (8) and (9) by including the sectoral dummy variables. In this way, the differences in productivity at the sectoral level are taken into account to correct the impact of natural behavior of foreign investors to target the most productive industries. If foreign investors invest in the most productive sectors (and it usually happens), then an endogeneity could arise at FP variable level, which it is fixed by including sectoral dummy variables (see also Aitken and Harrison, 1999). The same endogeneity can be responsible for an overstated impact of foreign ownership on production in regression (1); if foreign investors invest in the most productive firms, then the impact on production is a significant one (regression 3 corrects the endogeneity by including sectoral dummy variables, resulting a negligible impact of foreign investment).

[4] For comparisons, there were used data available through international databases - REUTERS

The coefficient of FI_FP interactive variable is insignificant, confirming the previous result (regression 3) after which foreign presence exerts same effects on firms foreign owned, as well as on domestic companies.

Thus, empirical analysis performed on the entire sample of 96 firms leads to two important results: (i) foreign ownership has a neutral impact on the production / productivity of firm, and (ii) foreign participation in the sector positively affects the performances of companies. Apparently, there are no differences between foreign and domestic firms by how they react to the foreign presence in the sector. However, the absence of significance in the FI_FP variable raises questions about the origin of the positive impact of FP variable: it is due to domestic, foreign firms or both?

To answer this question, we divide the sample into two sub-samples: one with domestic firms (56 firms) and the other with firms that have been foreign owned for at least one sub-period in the analyzed period (40 companies). Empirical analysis will be undertaken, separately, on the two sub-samples.

Table 3: The Impact of FDI on the Firms Production and Productivity with Domestic Participation in Romania, 2003-2008

The independent variable	(10)	(11)	(12)	(13)	(14)
Constant	3.84***	4.47***	-1.31***	-2.49***	-2.5***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CAP			0.20***	0.13***	0.19***
			(0.00)	(0.00)	(0.00)
LAB			0.51***	0.69***	0.68***
			(0.00)	(0.00)	(0.00)
MAT			0.39***	0.29***	0.25***
			(0.00)	(0.00)	(0.00)
FP	0.48*	0.21	0.36**	0.28*	0.21
	(0.05)	(0.38)	(0.01)	(0.09)	(0.55)
RD					-0.009
					(0.57)
RD_FP					-0.006
					(0.91)
DUM_YEAR		x		x	x
DUM_SECT		x		x	x
Obs	*333*	*333*	*333*	*333*	*260*
R2 centered	*0.88*	*0.91*	*0.95*	*0.95*	*0.96*

Note: In parentheses are p-values. *** Means significant coefficients 1%, ** significant 5% and * significant 10%. Estimates were made after the specific techniques of the panel using WinRATS. Regressions imply the existence of random individual effects, GLS is the method to estimate the coefficients. Total number of observations is 336 (56 observed firms over the six years).

Limiting the sample to that of domestic owned firms, we found that the elasticities of production factors in the regressions (12) - (14), do not essentially differ from those found on the entire sample.

The coefficient of foreign presence is sometimes insignificant, especially when dummy variables representing years and sectors of activity are introduced in the regression. Using dummy variables to isolate the period peculiarities characterized by a boom of FDI in Romania, allows identifying the impact of foreign presence, independently of other factors. Regression (14) has the highest explanatory power, resulting that the foreign presence at the sectoral level does not significantly influence the productivity of domestic firms, in the absence of influences of general economic context and of sectoral differences.

The results on RD and RD_FP variables support the idea according to which domestic companies' production is not R&D grounded, and that reduces its absorption capacity, so they can not benefit enough from foreign presence.

Finally, the study on the sub-sample of firms with foreign ownership in Romania, leads us to the results below.

Table 4: The Impact of FDI on the Firms Production and Productivity with Foreign Participation in Romania, 2003-2008

The independent variable	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Constant	4.71*** (0.00)	4.48*** (0.00)	6.29*** (0.00)	-0.74 (0.12)	-0.78 (0.12)	-1.70* (0.09)	-1.81* (0.07)
CAP				0.25*** (0.00)	0.22*** (0.00)	0.08* (0.06)	0.09** (0.03)
LAB				0.51*** (0.00)	0.51*** (0.00)	0.79*** (0.00)	0.79*** (0.00)
MAT				0.29*** (0.00)	0.27*** (0.00)	0.11** (0.03)	0.11** (0.03)
FI	0.84*** (0.00)	0.16 (0.49)	0.20 (0.43)	0.06 (0.66)	-0.10 (0.66)	0.15 (0.47)	0.28 (0.19)
FP		0.90*** (0.00)	0.66*** (0.00)		0.44*** (0.00)	0.57*** (0.00)	0.59*** (0.00)
FI_FP			-0.82** (0.03)		-0.13 (0.70)	-0.72** (0.02)	-0.89*** (0.00)
RD				0.01 (0.36)	0.001 (0.91)	-0.008 (0.49)	-0.03** (0.03)
RD_FI							0.06** (0.02)
DUM_YEAR			x			x	x
DUM_SECT			x			x	x
Obs	*149*	*147*	*147*	*131*	*129*	*129*	*129*
R2 centered	*0.96*	*0.96*	*0.98*	*0.98*	*0.98*	*0.99*	*0.99*

Note: In parentheses are p-values. *** Means significant coefficients 1%, ** significant 5% and * significant 10%. Estimates were made after the specific techniques of the panel using WinRATS. Regressions imply the existence of random individual effects; GLS is the method to estimate the coefficients. Total number of observations is 240 (40 observed firms over the six years).

The elasticities of production factors are significant in regressions (18) - (21), beeing higher for labor factor and lower for capital factor than in the case of domestic firms sub-sample. Therefore, the productivity is labor based in a greater extent for foreign owned firms than for domestic firms. The productive capital and current assets, as productivity determinants, are less important for foreign firms than for the domestic ones.

The foreign investment variable, having a positive and significant coefficient of 1% in regression (15) losses its significance once foreign presence variable introduced. It is possible that FP variable may take the most important part of the FI effect on production. This result confirms the neutrality of foreign ownership for company's performance.

The coefficient of foreign participation in the sector is one with high significance (1%), indicating that foreign firms operating in sectors with a large foreign participation have benefits in terms of both production and productivity. The rise of foreign presence in sector by 10% brings to the increase of production and productivity of foreign firms which operate in these sectors by about 6% (regressions 17 and 21). The impact of foreign presence is more important for foreign firms than for domestic ones (see the variable coefficients in the analysis of total sample and the sample of domestic companies).

Somewhat surprising is the sign of the FI_FP interactive variable coefficient. We interpret it as follows: in order that the foreign presence in the sector enhances a positive effect on foreign company's productivity, foreign ownership must not exceed 66%[5]. If foreign companies' ownership rights exceed 66%, the foreign presence in the sector causes a negative impact. That may be due to fierce competition that arises at sectoral level. In our sample, of the 40 companies that have been foreign owned in the reported period, 23 companies have improved their performances as a result of foreign presence in the sector, while 17 firms experienced a negative impact.

As for results on the RD and RD_FI variables, an initial valuation is that the foreign firms' expenses for research and development do not significantly influence productivity, only by interacting with the foreign ownership. For the foreign ownership rights exceeding 50% of equity, the impact of R&D expenditure on firm productivity is positive, and negative in the case of a foreign ownership rights less than 50%[6]. Consequently, in order that the innovation supports business productivity, it must be associated with a minimum of 50% foreign investment. In our sample, of the 40 companies that have been foreign owned in the analyzed period, only 25 companies have improved their productivity on account of R&D expenditure; these firms were those characterized by a sufficient absorption capacity to assimilate the knowledge transfered by foreign investor.

4. Conclusions

To summarize the results of the empirical analysis, we can assert that, our study results support the following hypothesis:

Foreign ownership has not a significant influence on production and productivity of firms (the result is the same in the entire sample, but also in the sub-sample of foreign firms). Therefore, foreign investment has a neutral impact, neither

[5] From (0.59-0.89*IS>0), results IS<0.66 (regression 21)
[6] From (-0.03+0.06*IS>0), results IS>0.5 (regression 21)

favorable, nor unfavorable for the production / productivity of firm. This result differs from that of Aitken and Harrison (1999) who found a positive influence of foreign participation, but the result obtained is joining the Lyroudi, Papanastasiou and Vamvakidis' (2004) results.

The foreign presence at the sectoral level enhances the production and productivity increase, but only in some of the companies with foreign participation (those characterized by ownership rights up to 66%), the rest representing a threat for foreign firms in competitive markets. Domestic companies benefit at most indirectly from foreign presence, by its impact on general economic context. The neutral effect of foreign presence on domestic firms is a better result than that obtained by Aitken and Harrison (1999) which recorded negative externalities.

Most companies in Romania do not invest enough in research and development activity, and that limits their ability to benefit from externalities (knowledge and know-how) that could arise from foreign ownership or foreign presence in the sector. The only companies that benefit from interaction of absorption capacity with foreign ownership are the foreign venture capital with a minimum of 50%. With this result we join the studies of Damijan et al. (2003), Aitken and Harrison (1999), Konings (2001).

Our study constitute, as we believe, an important contribution to the literature set of FDI-growth relationship, underling the FDI non-significant contribution to firm production and pessimist results on technological transfers from foreign investors in Romania. Nevertheless, our conclusions sustain the nuanced approach on FDI role, conditioned by a sufficient absorption capacity in the host country. As we found, the guarantee for a FDI positive impact in economy is obtained only if the absorption capacity is ameliorated. The efforts should orient in such direction, before looking to attract foreign capital volatile flows at any cost.

When FDI economic role is invoked, the efforts should be concentrated to facilitate positive externalities from foreign investors, particularly strictly regulating the competitive relationships and creating an entrepreneurial culture that would make domestic companies responsive to information and knowledge resulting from interaction with foreign companies on the market. Second, public policy must be oriented to public and private investment in research and development activity, which are able to transform FDI in a real engine of economic growth. Even in the context of economic crisis, the reduction of public expenses on research is not an inspired measure; they must be supported by the public money. And private investment in research and development can be encouraged through a series of public leverage, such as, for example, the fiscal one (deductibility of research and development expenditure).

We believe that such an analysis is necessary especially in the current context of global economic crisis. This new environment challenge Romania to identify the more appropriate channels to generate economic growth. If recently FDI were considered the engine for economic growth, now attracting foreign capitals become a more difficult task, because international capital flows reduced. Our paper can not establish a powerful relationship between capital inflows and economic growth, so we consider that the Romanian growth is not dependent from foreign capital. In the crisis context, this is a positive fact, other channels having to be indentified to generate economic growth. Certainly, one politics independent of external capital flows is not an alternative good solution, so the openness should be rationale and completed by appropriate politics for the internal development.

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Appendix

Empirical studies	Channel for ensure growth - hypothesis	Sample	Period	Results
Krkoska (2001)	Capital accumulation	25 transition countries (macro-level)	1989-2000	FDI effects confirmed
Damijan et al (2003)	Tecnological transfers	8 CEECs (micro-level)	1994-1998	FDI effects confirmed for foreign firms, but negatives horizontal externalities
Aitken & Harrison (1999)	Dual (capital accumulation & technological transfers)	Venezuela (micro-level)	1976-1989	FDI effects valuable only for foreign firms; negatives externalities
Konings (2001)	Dual	3 CEECs (micro-level)	1993-1997	Foreign companies perform better than national ones; externalities are missing
Lyroudi et al. (2004)	Capital accumulation	17 transition countries (macro-level)	1995-1998	Reject FDI catalytic role regardless of country development level
Wang (2009)	Dual	12 asiatic countries (macro-level)	1987-1997	The positive FDI effect on growth depends of a sufficient absorption capacity of advanced tecnology
Borensztein et al (1998)	Dual	69 developping countries	1970-1989	FDI effect on growth depends on human capital availability in host country

STUDIA UBB, OECONOMICA, VOLUME 58, ISSUE 3, 2013

BENEFICIARIES' PERCEPTION CONCERNING THE IMPLEMENTATION OF EU FINANCED PROJECTS

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Abstract. European Union (EU) financed projects is a major subject for discussions at member states' level and worldwide, given their major impact on countries' development. The main information source concerning projects' implementation all over Europe is the European Commission (EC). The current research represents an alternative information source concerning projects' implementation for the Northwest Region of Romania. While EC's approach is mainly technical, most documents ensuring guidance for the administration, the current research is based on a questionnaire completed by management team members of projects. The research identifies the main problems that project team members face when dealing with projects financed by the European Union. An important effort shall be made by future Romanian administrations in order to improve the opinions Romanian projects' team members concerning EU financed projects and to increase the absorption rate of European funds. The research is considered to be of great interest especially now, when Europe is facing a new development stage.

JEL Classification: O22, M00

Key words: EU financed projects, project management, program

1. Introduction

Projects and programs are increasingly common in organizations, in the public and private sector, project management becoming an organizational strategy that needs to deal with a complex and dynamic economic environment, and also a preoccupation at micro and macro-economic level (Gareis, Huemann, 2001).

EU financed projects are a unique type of projects implemented all over Europe under the same rules imposed by EC. However, projects' impact and results are very different all over Europe due to local elements. Some countries

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have viable systems and experience for implementing European projects, while others, as Romania today, search for successful systems in coordinating projects implementation.

There are numerous studies and documents referring to the European funding opportunities and the European financed projects, as: the National Development Plan, the National Strategic Reference Framework etc. Reviewing these documents, we observed that they have a technical perspective. They are very useful for providing direct guidance for local administrations based on macro-level systems' analysis. They analyze the attainment degree for each anticipated objective. These documents represent important instruments developed for each EU country, based on the European priorities.

In order to improve the local system, local studies should be performed and micro-level analysis should be used for identifying real problems existing in this specific area. The present article focuses on beneficiaries' opinions considering EU projects' implementation. For finding the real problems beneficiaries have, we used a questionnaire.

The results of this research are important for both the administration involved in managing projects financed by the EU and the beneficiaries of the European funding. However, in order to build a more complex plan for improving the management of these projects other analysis can be performed.

The present article represents an important contribution to this specific research area, being organized as described below:

1. A literature review is performed within the first part concerning project management in general and other similar researches performed in the field.

2. The second part contains a general description about European funds as a chance for improving Romania's competitiveness. Several details are provided: the elements which bring the specificity of these projects, the amounts funded for each funding program and the general situation of these projects at EU level.

3. The research methodology is presented within the third part of the article. The questionnaire we have used, the population and the statistical tests are described.

4. Within the fourth part of the article the results are presented in three subchapters corresponding to each analysis we have performed. The first analysis is related to the project proposal preparation and application for funding phase. The second concerns the project implementation phase, while the third subchapter contains an inter-programs analysis. Relating the received answers with the programs through which projects benefit from financial support is important, because some aspects might be functioning better with certain programs than with others.

The conclusions of the article are presented within the last part of the article. Also, several solutions are provided based on the problems identified during the research.

Although the questionnaire is a good tool for identifying the current situation, the limits of this research are linked to the number of management team members who completed the questionnaire. The study should be extended on a larger number of respondents and different research tools can be used in order to complete the research results.

2. Literature review

Project management is an alternative method for organizing economic activities. In a society dominated by dynamism and complexity, projects are commonly used for attaining, in an effective and efficient manner, specific objectives and, as a result on long term, the anticipated competitive advantage of the company. Organizing the activity based on projects provides advantages both for private and for public organizations.

Project management research and practice are both influenced by the perceptions one has concerning projects (Cleland, Gareis, 2006, p. 2-2). Traditionally, projects are considered sets of activities performed for attaining an objective. A project can be defined by its specific goal, timeline, limited costs and resources (Gareis, 2005, p. 39). According to this paradigm, projects are defined as "unique, transient endeavors undertaken to achieve a desired outcome" (Association for Project Management, 2006, p. 3). Another definition is the one used by the Project Management Institute, one of the largest professional organizations of project managers in the world: "A project is a temporary endeavor undertaken to create a unique product, service, or result" (Project Management Institute, 2008, p. 5). According to IPMA: "A project is a time and cost constrained operation to realize a set of defined deliverables (the scope to fulfill the project's objectives) up to quality standards and requirements" (International Project Management Association, 2006, p.13).

Another paradigm focuses on the temporarily existence of the project and considers projects to be temporary organizations. According to this paradigm, a project is "a temporary organization that is created for the purpose of delivering one or more business products according to an agreed Business Case" (Office of Government Commerce, 2009, p. 4). In order for a project to be successful, other elements such as values the context where the project is implemented need to be identified (Gareis, 2005, p. 39-40).

An extended view on projects, mentioned by Gareis (2005), is the one which perceives projects as social systems. A project has specific inputs, processes and outputs; it has delimited boundaries and exists in a social environment.

As it can be observed, the provided paradigms reflect the evolution of projects' perception from traditional activities to complex systems. These evolved projects need complex management methods and techniques in order to attain their final goal. Project management is a relatively new research and practice area, in continuous evolution. It can influence firm's competitive advantage attainment or its failure. However, it has a major contribution for firm's success (Whitty, Maylor, 2009, p. 304).

The funding source of projects has an important influence on their management. In our research we approach projects financed by the European Union, as a special type of projects that have specific characteristics and need an adapted type of management.

The researched topic is of particular importance, especially now when we face a new stage of development in Europe (2014 - 2020), a period in which useful lessons can be learned from the development period 2007-2013. The economic, political and cultural crisis brings the importance of these projects at different levels

as long as “the European project has recently reached a critical point, where a discussion on the fundamental objectives of the European Union has entered public debate” (Hartleb, 2012, p. 45). In this context, our research is a current topic which focuses on the realities existing today in Romania.

A similar study relevant to our research was made by a group of consulting firms (KPMG Romania, GEA S&C and Pluriconsult) in cooperation with the Authority for Coordination of Structural Instruments, in 2010. One of the aspects approached in this study are the factors that have a negative influence on the performance of Structural Instruments in Romania. Also, Zaman and Cristea (2011) presented in their study the obstacles and issues that influence the absorption of European funds in Romania.

3. European funds contributing to the development of European regions

A case with an important impact on the development of European countries is that of projects financed through European funds. These projects are implemented all over Europe according to specific practices which involve a particular project management approach. The final goal of these projects is to ensure the appropriate economic and social development for all European regions, in order to reduce disparities and poverty all over Europe. The sustainable development is the major goal, though projects influence the life of citizens, firms, regions and even current social systems (Morton, 2009, p. 3). The regional development policy is one of the most important and complex policies of the European Union, with the main goal of reducing economic and social disparities between different European regions and obtaining an adequate competitiveness level for the new economic environment (European Institute from Romania, 2003, p. 4).

For the period 2007-2013 the European funds available for Romania are estimated at 19,667 million Euros as Structural Funds and Cohesion Funds. About 98% of this sum is allocated for six Operational Programmes related to the Convergence Objective, while 2% are allocated to the Operational Program for Territorial Cooperation (Office for Official Publications of the European Communities, 2007, p. 25). Romania is involved also in the implementation of complementary European Funds (European Agricultural Fund for Rural Development and European Fisheries Fund). These programmes can positively influence Romania’s development if viable and with long-term impact projects are implemented. The structural instruments according to the terminology used in 2007-2013 contains: European Regional Development Fund (ERDF), European Social Fund (ESF) – both known as “structural funds”, and the Cohesion Fund (CF) (Romanian Government, 2007, p. 8). Within the next table the Operational Programmes related to “Convergence” and “European Territorial Cooperation”, their EU financing and quota from the total are presented. The allocation for the National Programme for Agricultural and Rural Development is of 7.5 billion Euros, while for the National Programme for Fisheries is of 307.6 million Euros.

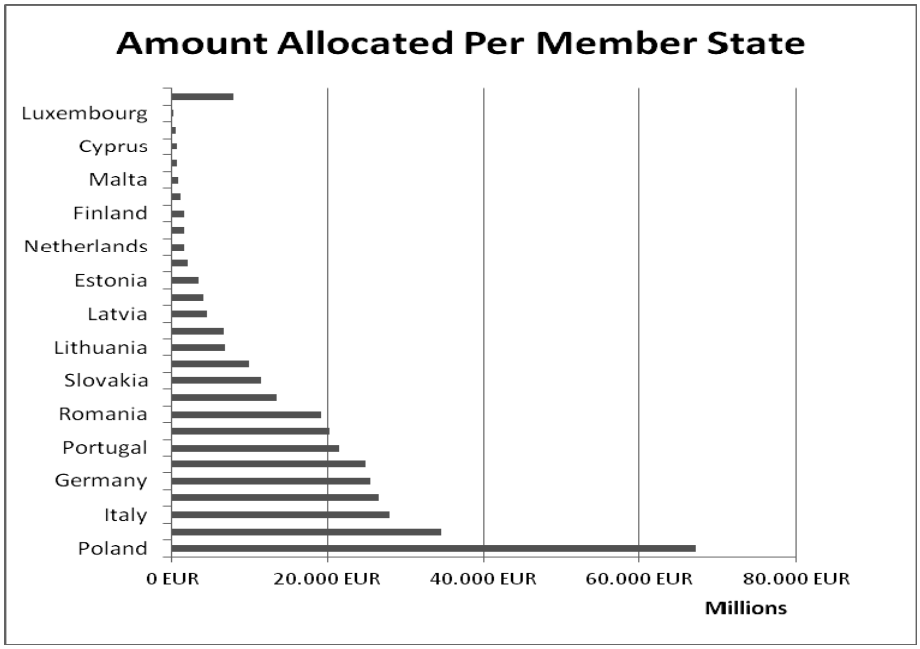
Table 1 - Romanian Operational Programmes for 2007 – 2013

Objective	Operational Programme	Allocated amounts		Fund
Convergence	*Transport*	4,010 mil. Euro	23%	ERDF+CF
	Environment	3,969 mil. Euro	23%	ERDF+CF
	Regional	3,275 mil. Euro	19%	ERDF
	Human Resources Development	3,050 mil. Euro	18%	ESF
	Economic Competitiveness	2,240 mil. Euro	13%	ERDF
	Administrative Capacity Development	185 mil. Euro	1%	ESF
	Technical assistance	150 mil. Euro	1%	ERDF
Territorial cooperation	*Territorial cooperation*	262 mil. Euro	2%	ERDF

Source: Romanian Government, 2007, p. 6-7

Comparing the funding allocation for member states in the current funding period (2007-2013), Romania is ranked on the fifth position (Figure 1). This represents a great development opportunity, for which unfortunately Romania was not prepared enough and as a result could not take full advantage of.

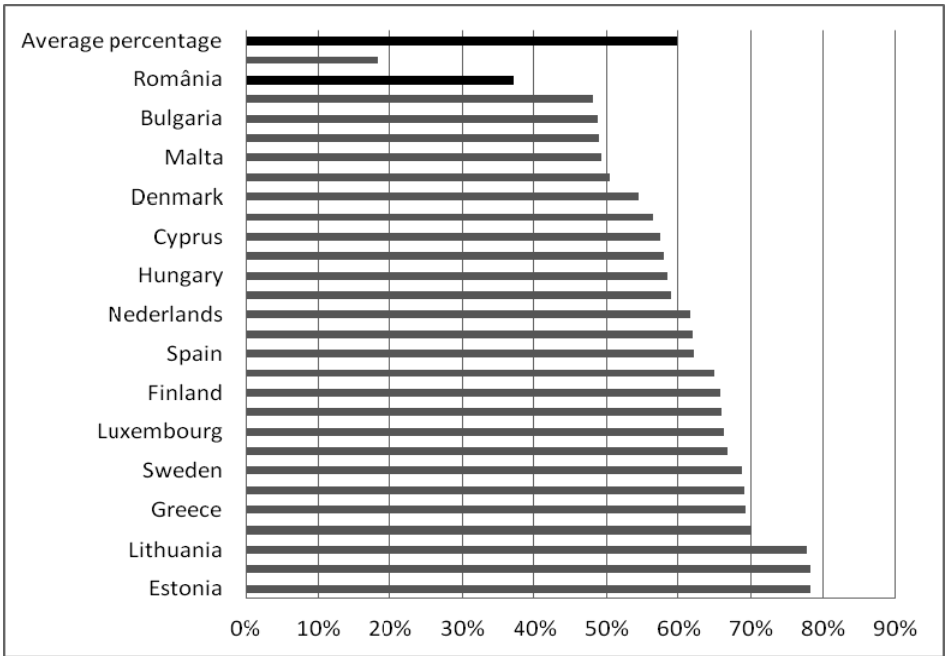
Figure 1 - Amount Allocated per Member State (2007-2013)



Source: http://ec.europa.eu/regional_policy/thefunds/funding/index_en.cfm, 10.12.2013

The level of payments made by the EC for each member state is a direct indicator for the level of efficiency in managing the European funding opportunities. The figure below presents the percentage of the total funds allocated per member state that was paid by the European Commission (Figure 2), based on the claims submitted. Romania in this case occupies the second last place with a percentage of 36.92%, at a significant distance from other member states and below the European average of 59.70%.

Figure 2 - Percentage of funds allocated per MS paid by the Commission



Source: http://ec.europa.eu/regional_policy/thefunds/funding/index_en.cfm, 10.12.2013

The main documents used for the implementation of structural funds in Romania are the National Development Plan (NDP) 2007-2013, the National Strategic Reference Framework (NSRF) and the Programmes Guidelines. The NDP is the document used by Romania for planning the priorities concerning public investments and ensures the major direction concerning the socio-economic development of the country in accordance to the Cohesion Policy of the EU. For 2007-2013 six priorities have been established: the increase of economic competitiveness and the development of the knowledge based economy, the development and the modernization of transport infrastructure, the protection and improvement of environment quality, the development of human resources, the development of rural economy and the increase of agricultural productivity, the decrease of disparities between national regions (Romanian Government, 2005, p. 5). The major goal is to obtain a GDP per capita of 41% of the EU average in 2013.

According to NDP, several documents are developed: the National Strategic Reference Framework, The National Strategic Plan for Rural Development, the National Strategic Plan for Fisheries, then the Guidelines for Operational Programmes, The National Programme for Rural Development and the Operational Program for Fisheries.

The institutions directly involved in project implementation at national level are: the Management Authority, the Intermediary Organism which has received some attributions from the Management Authority, and the Payments and Debts Certification Authority. The European Commission is the supervisor of the whole process; it ensures the payments to the Payments and Debts Certification Authority and collaborates with the monitoring committee for the appropriate projects' implementation. The monitoring committee ensures the governance for all public institutions involved as management authorities. The Management Authority, together with the Intermediary Organisms created as substructures for this authority, is responsible for project selection and implementation. The Audit Authority verifies the functioning of the Management Authority and the control realized by this authority. The institutions involved in programs' implementation and the relationship between them are presented by Sorici et al (2010) in the paper *Project management and sustainable development*.

In simple steps, the activities a beneficiary should perform are: to prepare a project proposal, to win the funding competition and then to implement the project. But, planning and implementing a project become crucial steps for companies and public institutions.

The main documents related to projects implementation are presented below:

a. The Project Cycle Management Guide – a guide which governs all EU projects. It identifies five phases for a project: programming, identification, formulation, implementation (including monitoring and reporting), evaluation and audit. This guide contains the framework for implementing European projects based on the logical framework as a method for analysis and a set of methods used for planning and implementing EU financed projects. The logical framework presents the results concerning a problem analysis considering the cause-and-effect relation. In this manner the objective of the project is adequately presented;

b. Beneficiary's guides – specific documents elaborated at national level for each axe of each program. They are useful both while searching for funding, planning a project proposal and implementing a project.

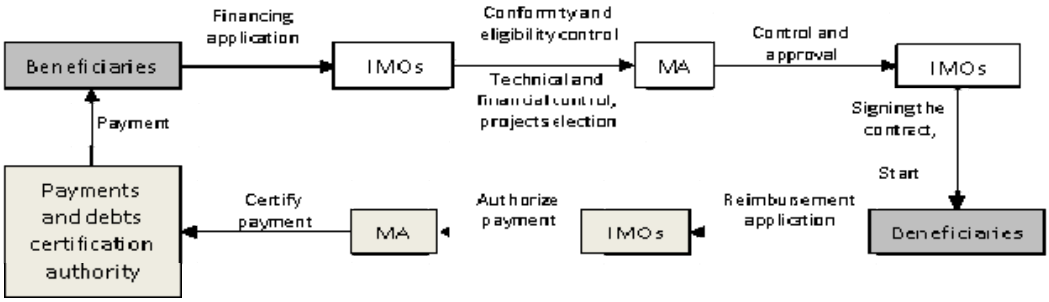
Considering the flow of the specific documents needed for implementing an EU financed project, two phases in the life cycle of a project can be identified:

1. **Project proposal preparation and application for funding.** The projects are usually selected as a result of a public opening of a call to the beneficiaries. After the call is launched, the beneficiary has a specific period of time (a deadline or until there are no funds left) for preparing a financing file and sending it to the intermediary organism. The financing file contains the project proposal or the financing application and the appendices. During the same phase there are included the administrative review of the application, checking the eligibility of the project, technical and financial evaluation and selecting the project for financing. This phase ends with signing the financing contract and starting the monitoring of the project;

2. **Implementation of the project.** Within this phase the beneficiary shall implement the project as written within the contract. A specific element related to EU financed projects is that the payments are made to beneficiaries through reimbursements, in two or several steps, depending on the value of the project. The beneficiary has to perform in advance the expenditures and to prove that these were made according to project specifications. The reimbursement applications are transmitted to the intermediary organism together with the proving documents. The financial and technical control is performed within the intermediary organism, while the management authority shall authorize the payment. The payment and debts certification authority makes the payment, while the last reimbursement application shall be finalized only after the final control of project implementation is performed.

These two phases are presented within the next figure (Figure 3):

Figure 3 - The process of implementing a European project



Source: Ministry of Communications and Information Society, http://fonduri.mcsi.ro/?q=node/13, 18.07.2012

Projects that benefit of European non-reimbursable financial aid have several characteristics which differentiate them from other projects (Bârgăoanu, 2005, p. 51-52):

a) The projects are financed based on a written proposal made through a standardized form;

b) The financing is made for ensuring the implementation of a specific EU policy, element which involves several constraints concerning beneficiary's eligibility, target group selection, activities and expenditures eligibility, financing amount;

c) Each project is a part of a larger project which has as a final goal the attainment of a specific objective related to each OP existent within each member state;

d) Some constraints concerning the budget lines exist;

e) The European Commission standard procedures are mandatory;

f) The beneficiary spends extra-time for studying the specific documents related to the call (ex. Beneficiary's Guide);

g) The amount provided by the financier shall not be recovered, the results concerning the specific policy attainment is what matters.

4. Research methodology

The goal of the empirical study presented in this article is to present beneficiaries' opinions considering EU projects' implementation in Romania and identify the main problems that influence the application for funding and the implementation.

The research instrument used in this study is a questionnaire focused on identifying the most frequent problems which team members of European financed projects face. The questionnaire has two parts. The first part contains a section concerning planning and developing a project proposal and a section related to the implementation phase of the project. Within this part a Likert scale is used as the subjects can estimate how much do they agree (very low to very high) to different statements concerning projects financed through European funds. The statements are built positive in order to have no influence on subjects' opinions. The second part refers to the identification data.

This questionnaire was sent through e-mail. Also, an on-line version of this questionnaire was built in order to encourage its completion.

The target population is represented by management team members of European financed projects. The projects whose management team-members are part of the population of interest:

- benefit from European funding through structural or complementary programs, in the period 2007 – 2013,
- are implemented in the Northwest region of Romania,
- are implemented by public or private institutions.

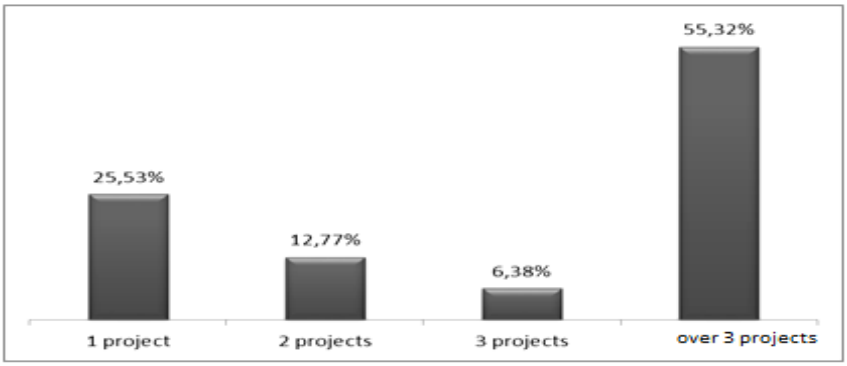
We chose the Northwest region for our study considering the development potential of the region and the generalization possibility of the study, as the Northwest region is ranked on an average level compared to other regions based on the number of contracted projects financed by the European Union.

The size of the management team for European financed projects is varied; as a consequence the determination of the population size is almost impossible. The sample we have used is a non-probabilistic sample conditioned by the time and the costs of the research. The methods used for establishing the sample are rational selection. An important support was offered by several project management consulting firms for questionnaire distribution.

The questionnaire was sent to 150 persons, management team members for different European financed projects from the Nord-West Region of Romania. A number of 47 responses were received, representing a 31.33% rate of success.

A percentage of 57.45% of management team members belong to public organizations and 42.25% represent private organizations. Most management team members belong to organizations with large experience in implementing European financed projects. The majority of these organizations have implemented already over 3 projects starting 2007 as beneficiary or partner (Figure 4):

Figure 4 - Organizations' experience concerning European projects



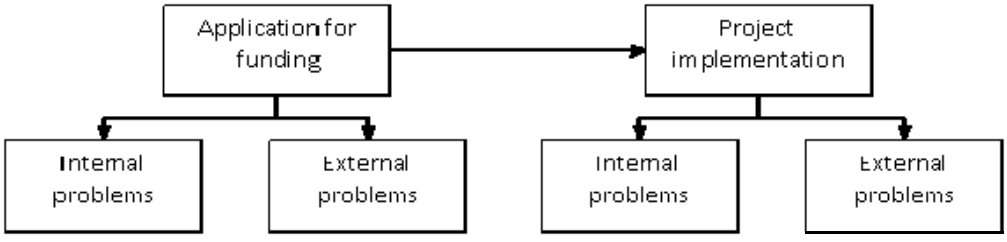
Source: own projection

The projects, for which the respondents are part of the management team, are financed through the programs: National Program for Rural Development (NPRD) – 8.51%, Environment (E) – 10.64%, Regional (R) – 44.68%, Human Resources Development (HRD) – 21.28%, Economic Competitiveness (EC) – 12.77%, and Administrative Capacity Development (ACD) – 2.13%. Projects financed through OP Regional and OP Human Resources Development, represent a higher percentage within the analyzed projects.

5. Results and discussion

The problems affecting the management of projects financed by the EU have a negative influence regarding the results and the impacts of projects. Most of the previous research performed in this field, both EU institutionalized or academic, has focused on the macro-level problems. The current approach is a process one, several aspects concerning projects' implementation being targeted, according to the next figure (Figure 5):

Figure 5 - The target areas of the research



Source: own projection

5.1. Preparing the project proposal and application for funding

For identifying the most common problems related to the phase of project proposal preparation and application for funding, we present in the following table the frequencies of the responses for all statements (Table 2):

Table 2 - Opinions regarding the management of projects financed by the EU related to project proposal preparation and application for funding

Statements	1	2	3	4	5
The team involved in planning and realizing the proposal has had the appropriate level of knowledge, competences and experience.	-	4.3%	23.4%	48.9%	23.4%
The project proposal has started by identifying the problems which need to be solved and project objectives.	2.1%	8.5%	12.8%	40.4%	36.2%
Project objectives are clear, realist and measurable.	-	2.1%	8.5%	59.6%	29.8%
Project budget has been soundly estimated, considering all the needed resources for project's implementation.		8.5%	14.9%	42.6%	34.0%
The specific procedures related to application for funding have an average complexity level.	4.3%	14.9%	19.1%	44.7%	17.0%
Duration between approval for funding of the project proposal and signing of the contract is appropriate to project requirements.	40.4%	27.7%	12.8%	19.1%	-
The level of bureaucracy in the preparation of the project proposal and funding request is low.	36.2%	27.7%	23.4%	12.7%	-
In sessions with project submission deadlines, the project submission period provides sufficient time to prepare the funding file.	6.4%	25.5%	27.7%	34.0%	6.4%
The sessions with project submission deadlines do not limit funding access.	6.4%	21.3%	34.0%	23.4%	14.9%
The duration of the evaluation period of the project proposal was appropriate.	38.3%	27.7%	19.1%	14.9%	-

1 - Strongly disagree, 2 - Disagree, 3 - Un-decided, 4 - Agree, 5 - Strongly agree
Source: own projection

Within the first part of the table managers opinions refer to their activity. The team which prepared the proposal had adequate experience and knowledge and the project plan was well done, considering both objectives and budget.

There are problems when it comes to their opinions concerning Romanian institutional support for these projects. Based on the frequency of the response for the statements that were ranked 1 – strongly disagree and 2 - disagree, several problems exist:

1) The specific procedures related to the application for funding have a high degree of complexity for almost 20% of the respondents;

2) The period of time between application approval and signing the contract is too long for more than 60%;

3) There exists a high bureaucracy level during the application for funding phase (more than 50% agree);

4) In sessions with project submission deadlines, the project submission period does not represent sufficient time to prepare the funding file for more than 30% of the respondents;

5) The duration of the evaluation period of the project proposal is too long for more than 50% percentage of the respondents.

5.2. Project implementation

In order to identify the most common problems related to this phase, we present in the following table the frequencies of the responses for all statements from the second part of the questionnaire (Table 3):

Table 3 - Opinions regarding the management of projects financed by the European Union related to project implementation

Statements	1	2	3	4	5
The team involved in project implementation has the appropriate level of knowledge and competences.	-	-	21.3%	55.3%	23.4%
The team involved in project implementation has the experience in implementing EU financed projects.	-	10.6%	12.8%	46.8%	29.8%
The dimension and the structure of the team are appropriate.	-	6.4%	25.5%	48.9%	19.2%
Team members' roles and the tasks have been clearly defined.	-	4.3%	23.4%	53.2%	19.1%
Project manager's responsibilities and tasks have been clearly defined and made known by all team members.	-	4.3%	27.7%	44.7%	23.3%
Communication and information means and methods are appropriate as number and functionality.	2.1%	6.4%	25.5%	48.9%	17.1%
The conflicts appeared during the implementation phase did not affect project's functioning, being well solved by the project manager.	6.4%	2.1%	14.9%	59.6%	17.0%
The project timeline has been considered without any changes.	17.0%	14.9%	36.2%	29.8%	2.1%
Co-financing was easily ensured.	8.5%	19.1%	21.3%	36.2%	14.9%
The economic context did not affect the project.	14.9%	29.8%	23.4%	25.5%	6.4%
The specific procedures related to reporting during project implementation have an adequate complexity level.	4.3%	21.3%	14.9%	42.5%	17.0%
The level of bureaucracy in the implementation phase of the project is low.	23,4%	42,6%	23,4%	8,5%	2,1%
The employees which ensure the monitoring of project implementation, belonging to the institutions responsible for EU financing, have sufficient experience in project management.	12.8%	17.0%	27.7%	36.2%	6.3%

Statements	1	2	3	4	5
The communication with intermediary organisms/ management authorities has improved project implementation.	10.6%	10.6%	31.9%	40.4%	6.5%
The pre-financing amount was adequate to project needs.	14.9%	12.8%	25.5%	36.2%	10.6%
Reimbursement payments were made on time.	23.4%	14.9%	23.4%	36.2%	2.1%
There were no difficulties for financing the project from own resources until reimbursement payments were made.	14.9%	25.5%	14.9%	31.9%	12.8%
The on-spot visits' frequency is adequate.	6.4%	2.1%	17.0%	51.1%	23.4%

1 - Strongly disagree, 2 - Disagree, 3 - Un-decided, 4 - Agree, 5 - Strongly agree

Source: own projection

Based on the frequency of the response for the statements that were ranked 1 – strongly disagree and 2 - disagree, several problems exist:

1) The project timeline was changed during the implementation of the project for many projects;

2) Co-financing was difficult to ensure for more than 20% of respondents;

3) The economic context negatively affected the implementation of the project for more than 40% of the projects;

4) The specific procedures related to reporting during project implementation have a high complexity level for almost 25% of the respondents;

5) The level of bureaucracy remains still high (for more than 60%);

6) The employees which ensure the monitoring of project implementation, belonging to the institutions responsible for EU financing, do not have sufficient experience in project management for more than 30% of the management team members;

7) The communication with intermediary organisms/ management authorities did not support the project implementation for almost 30%;

8) The pre-financing amount was not adequate to project needs for more than 25% of the respondents;

9) The reimbursement payments have been made too late for almost 40% of the respondents.

The main difficulty while implementing an EU financed project is related to the late payment of reimbursements. A detailed analysis concerning this aspect has been made using Pearson correlation coefficient for two statements: There were no difficulties for financing the project from own resources until reimbursement payments were made and Reimbursement payments were made on time (Table 4).

Pearson correlation coefficient values 0.609. This can be interpreted as a positive correlation between the statements with an average intensity. If payments are made on time, there are no major difficulties for sustaining project financing from internal resources.

Table 4 - Correlation between the timing of reimbursements' payments and the difficulties on financing the project from own resources

		There were no difficulties for financing the project from own resources until reimbursement payments were made.	*Reimbursement payments were made on time.*
There were no difficulties for financing the project from own resources until reimbursement payments were made.	Pearson Correlation	1	,609**
	Sig. (2-tailed)		,000
	N	47	47
Reimbursement payments were made on time.	Pearson Correlation	,609**	1
	Sig. (2-tailed)	,000	
	N	47	47

**. Correlation is significant at the 0.01 level (2-tailed).

Source: own projection

10) There were difficulties for financing the project from own resources until reimbursement payments were made for more than 40% of the projects.

As it can be observed, most of the identified problems occur due to the external environment of the project. Unfortunately, about 40% of the respondents have a bad opinion concerning the way things were handled by management authorities and intermediary organisms.

5.3. Inter-programs analysis

An important question is whether all programs are implemented in the same manner and whether beneficiaries' perception differs from program to program. Given the multitude of institutions responsible for projects' monitoring, some differences might appear.

In order to answer this question, we have performed ANOVA for testing the inclusion of one project within a program and the existence of specific problems:

1. We analyzed the complexity level of specific procedures related to application for funding (Table 5). Based on the results presented below we can state that there is no relation between the program type a project belongs to and procedures complexity.

Table 5 - Testing the relationship between the complexity level of the procedures and the funding program - **ANOVA**

The specific procedures related to application for funding have an average complexity level.

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	2,981	5	,596	,483	,787
Within Groups	50,636	41	1,235		
Total	53,617	46			

Source: own projection

2. Another analyzed aspect is the duration between application approval and signing the financing contract (Table 6). Sig. in this case is 0.009. Given this result, the conclusion is that there are major differences between different programs concerning this duration.

Table 6 - Testing the relationship between the duration between application approval and signing the financing contract and the funding program - **ANOVA**

Duration between approval for funding of the project proposal and signing of the contract is appropriate to project requirements.

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	18,297	5	3,659	3,558	,009
Within Groups	42,171	41	1,029		
Total	60,468	46			

Source: own projection

3. The bureaucracy level during application for funding is also of interest. According to the statistical test presented below, there are no relations between projects' belongingness to a certain program and the level of bureaucracy (Table 7).

Table 7 - Testing the relationship between bureaucracy level during application for funding and the funding program - **ANOVA**

The level of bureaucracy in the preparation of the project proposal and funding request is low.

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	9,684	5	1,937	1,911	,113
Within Groups	41,550	41	1,013		
Total	51,234	46			

Source: own projection

4. The duration of the evaluation period of the project proposal related to the funding program was also analyzed. Based on the relevance level given by Sig., we can state that there is no relation between this problem and the funding program (Table 8).

Table 8 - Testing the relationship between the duration of the evaluation period of the project proposal and the funding program - **ANOVA**

The duration of the evaluation period of the project proposal was appropriate.

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	9,663	5	1,933	1,769	,141
Within Groups	44,805	41	1,093		
Total	54,468	46			

Source: own projection

5. The relationship between the complexity level of specific procedures related to reporting during project implementation and the funding program was also tested. Based on the results presented below, we can state that there is no relation between the type of program a project belongs to and the procedures' complexity during project implementation (Table 9).

Table 9 - Testing the relationship between the specific reporting procedures and the funding program - **ANOVA**

The specific procedures related to reporting during project implementation have an adequate complexity level.

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	9,814	5	1,963	1,613	,178
Within Groups	49,888	41	1,217		
Total	59,702	46			

Source: own projection

6. There is no relationship between projects' belongingness to a program and the level of bureaucracy in the implementation phase of the project (Table 10).

Table 10 - Testing the relationship between the level of bureaucracy in the implementation phase and the funding program - **ANOVA**

The level of bureaucracy in the implementation phase of the project is low.

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	6,876	5	1,375	1,501	,211
Within Groups	37,550	41	,916		
Total	44,426	46			

Source: own projection

7. Another issue considered is the level of experience of the persons who ensure the monitoring of projects' implementation (Table 11). Based on the received responses, it seems that there are programs with more experienced employees and programs with less experienced employees. The experience of the persons ensuring the monitoring of projects implementation is a direct factor that should facilitate the implementation of the projects and support the funding beneficiaries.

Table 11 - Testing the relationship between the level of experience of the persons who ensure the monitoring of projects and the funding program - **ANOVA**

The employees which ensure the monitoring of project implementation, belonging to the institutions responsible for EU financing, have sufficient experience in project management.

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	16,482	5	3,296	3,049	,020
Within Groups	44,326	41	1,081		

The employees which ensure the monitoring of project implementation, belonging to the institutions responsible for EU financing, have sufficient experience in project management.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	16,482	5	3,296	3,049	,020
Within Groups	44,326	41	1,081		
Total	60,809	46			

Source: own projection

8. There is no significant relation between the way communication is performed and the programs the projects belong to (Table 12).

Table 12 - Testing the relationship between the communication with management authorities and the funding program - **ANOVA**

The communication with intermediary organisms/ management authorities has improved project implementation.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	11,487	5	2,297	2,222	,070
Within Groups	42,386	41	1,034		
Total	53,872	46			

Source: own projection

9. The late payment of reimbursements is a problem frequently noticed. We tested the relationship between the time payment of reimbursements and the funding program (Table 13).

Table 13 - Testing the relationship between the time payment of reimbursements and the funding program - **ANOVA**

Reimbursement payments were made on time.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	31,346	5	6,269	6,672	,000
Within Groups	38,526	41	,940		
Total	69,872	46			

Source: own projection

The result of the statistical test performed show that the timing of reimbursements is influenced by the program the project belongs to, with a probability of 99%.

As a general conclusion regarding inter-programs analysis, there are programs which have performed a more effective activity than others. There is not a viable system yet for monitoring and supporting projects financed by the EU and the major source of success is the human resource. Unfortunately, this means that the system does not work properly and only high efforts performed by few persons generate good results.

6. Conclusions

In order to solve the identified problems, a more effective management at the level of the institutions responsible for the management of European funds is needed. Reducing bureaucracy in the application for financing phase and in the project implementation phase, promoting a partnership relationship between the intermediate authorities of management and the funding recipients, would encourage the absorption of funds. A major challenge for future Romanian administrations is to create a system for implementing this type of projects. We have observed problems all over the process: assistance and procedures during the application for funding phase; procedures, bureaucracy, late payments, low support during implementation phase. An alternative would be the centralization of all funding programs under a single management authority.

To protect themselves from the possible negative impact of general economic framework on the project, we consider that management teams should establish different scenarios and sets of action, which consider the evolution of the exchange rate, interest rate etc. during planning phase. An internal quite frequent issue is the existence of difficulties in supporting the project from own sources until the reimbursement, especially because of the frequent delays of the reimbursement payments. The solution proposed by us for this problem is to identify alternative sources of financing, which can be used when needed.

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HUMAN RESOURCE MANAGEMENT PRACTICES AND HOTEL INNOVATION

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Abstract. In this study, we investigate how hotels can promote incremental and radical innovation through human resource management practices. This sector of activity is labor-intensive so the analysis of selection, training and providing a favorable support system for employees deserve attention in order to determine their impact on innovation (radical and/or incremental) that would lead to a competitive advantage in terms of tourism services/products offered or provision of services.
The data in the paper comes from a questionnaire administered to hotel managers in a representative sample of hotels in Braşov County. Results show that hiring multi-skilled customer-contact employees and training them have significant and positive effects on both incremental and radical innovation among hotel. Also, results suggest that hotels managers adopt the approach "hire for multiple skills and train for basic skill" which implies they don't allocate enough financial resources for investing in human resources.

JEL Classification: M12, L83

Keywords: hotel, innovation, selection, training, human resource

1. Introduction

Taking into consideration the increased requirements and interests of tourists, hotel managers need to develop and implement innovations that would lead to authentic and memorable experiences, because, as Pizam (2010:343) states, this is the essence and the raison d'etre of the hospitality sector.

Innovation is one of the most important factors that influence hotels' success, having an impact on improving quality of products and service delivery, increasing performance, differentiating from competitors and, as we said, better answering to changing and increasing needs of customers.

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Hotels' employees have an important role in developing incremental and radical innovation and their success is strongly linked to HRM practices (Ottenbacher, 2007:446). Moreover, researchers say that, innovation's dependence on human capital may be even more important in the hotel sector (Tsaur and Lin, 2004; Yeung, 2006), because of the intangible nature of services.

In this study, we investigate HRM practices as antecedents of innovation in hotels. More precisely we focus on three specific HRM practices: selection, training and providing an appropriate frame to innovate based on offering a support system that allows employees to easily respond to their daily duties. These HRM practices are related to customer-contact employees. HRM no longer just encompasses a supportive administrative function, relating to the hotels' human resource transactions; HRM is also a strategic function and need to engage them in innovation decisions, as advisor and partner of management team.

2. Conceptual background and research hypotheses

Researching hotel innovation is recent, less exhaustive and modest, although tourism practice has significantly advanced (Hjalager 2010:1). Because of this gap, there is no clear-cut and unanimously accepted definition of hotel innovation, but there are many interpretations and opinions, most of them coming from production or service sectors of activity:

- Innovation is the key factor in the success of hotels that allow them to: improve their quality of tourism products/services and efficiency, reduce costs, meet the needs of tourists, increase their sales, profits and market share, namely to differentiate themselves from competitors (Ottenbacher and Gnoth, 2005). Observe the generality of the definition that focuses in large measure on the importance of innovation;
- Innovation creates new possibilities for obtaining added value for tourist taking into account not only the service or the delivery system, but also market-related elements (egg: entering a new market or developing a new market), management (egg: reorganization of hotels) or resources (egg: use of new management software) (Jansen et al., 2006). As noted, the definition focuses on how innovation in hotels can be achieved, but not on concrete definition of the concept;
- Innovation leads to something new or otherwise (Hjalager, 2002). The original definition given by Schumpeter (1934) was focused on the production, but is used in many areas, because it is very suggestive;
- Innovation is the generation, acceptance and implementation of new ideas, processes, products or services (Hall and Williams, 2008:5).

Hence, there is no consensus on defining hotel innovation, but it is widely accepted that innovation is an effective way to diversify the services provided within hotels with positive impact on the performance of hotels (Ottenbacher, 2007:432) and tourists' satisfaction. Based on this lack, distinguishing innovation types is not simple, but we want to bring into light three important criteria

a) from the perspective of people that develop innovations, they are centralized or decentralized: centralized innovations are developed by employees from the marketing department of the hotel and decentralized ones are developed

by employees who are in direct contact with tourists (Moosa and Panurach, 2008); in our study we will analyze the second ones, taking into consideration the fact that front-line staff determine the quality of output based on the closer provider–customer interaction

b) in terms of degree of novelty, innovations are radical or incremental. Radical innovations involve the provision of services which have not been on the market before or developing new systems for delivering existing services, while incremental innovations are improvements of existing services (Militaru, 2010:61). It is suggested that both types of innovation should be taken into account by the hotels (Damanpour, 1991), each having a positive impact on performance (Jansen et al., 2006). Some researchers consider that innovation need not be radical and unpredictable to be considered true innovation (Martínez-Rosa and Orfila-Sintes, 2012 after Scumpeter), but we consider that both type of innovation determine benefits for the tourists, that why in this study we analyze what HRM practices determine developing and implementing radical and incremental innovation.

c) a final classification criterion is the level at which innovation occurs: range of tourism products and services, delivery process, management or logistics used.Innovation at the level of tourism products and services refers to various changes in the products/services noticed by tourists and perceived as new for the market or hotel. Innovation of products or services may be a factor influencing the buying decision of the tourist (Hjalager, 2010:4). Many studies that have been conducted identified many examples of innovative services in terms of food, entertainment and wellness facilities (Jacob et al., 2003), customizing comfort conditions (Enz and Siguaw, 2003) all with positive effects on organizational performance and satisfaction of tourists.

Process delivery innovation is considering using a new and more efficient methods of service provision (Moutinho, 2010:128), which result in added value. Most studies analyze the use of information and communication technology, one of the most important source of innovation of providing tourism services (O'Connor et al., 2008) that would lead to increased employee productivity, while, simultaneously HR practices involving improving key skills are implemented (Blake et al., 2006).

Innovation in management is considering a number of actions such as: the development of job descriptions or new organizational structures, improve internal communications, charting new responsibilities to employees or the practice of career management (Ottenbacher and Gnoth, 2005).

Studies show that employees who can meet this challenge of innovating have the following qualities: the ability to quickly identify the objectives to which they must pay more attention, the courage to propose ideas and solutions, sociability and cooperation, task orientation, individual responsibility, but also in teams, applying their own working methods, open minded to management ideas and decision, ability to accurately evaluate performance, provide feedback, participate in creating a climate of trust and not lastly, expression and argumentation of differing opinions than others (Chen, 2011:65).

Therefore, HRM practices for selection of human resources, investments in improving the professional profile of human resources (training) and providing necessary support for carrying out the activity are extremely important to generate innovative ideas.

Studies show that efficient selection of human resources, along with training, has a great impact on radical and incremental hotel innovation (Chang et al., 2011:813), but we have to mention that the number of these studies is relatively slight. Thus we observe two problems that are analyzed in terms of probability of developing innovation by human resources from hotels:

a) Some studies point out that this probability is higher when the selection process determines employing only those people who have multiple skills, abilities and qualifications- the so-called philosophy "hire for skills and make training for improvement "that would lead to the most important categories of innovations, radical ones (Ottenbacher, 2007);

b) Other studies highlight the fact that this probability is higher if the selection process determines employing those who have the right attitude, native inclination to service and willingness to serve the consumer and offer them the opportunity to develop and improve creativity and skills; this HRM practice would lead to the development of both radical and incremental innovations - the so-called philosophy " hire for attitude and conduct trainings for skills " (De Dreu et al., 2008).

In the same context, we mention the (new) Romanian legislation (Ordinul nr.65/2013 issued by National Authority for Tourism-ANT) that requires that all hotel employees have to be proper qualified (the previous situation in terms of qualification was: 90% of 5 star hotel's employees, 80% of 4 star hotel's employees, 60% of 3 star hotel's employees and 40% of 1 and 2 star hotel's employees).

These arguments have led us to develop the following hypothesis:

H1: Hiring customer-contact employees with multiple skills has a positive impact on (A) incremental and (B) radical innovation among hotels.

As we already mentioned, training is another HRM practice that creates an optimal frame work for employees in order to develop innovations. These trainings should aim at obtaining technical but also interactive knowledge. Technical knowledge is related to the mechanical aspects of the work carried out and their continuous improvement becomes necessary, in particular when the activity is influenced by information and communication technology. Interactive knowledge allows the employee to responsibly and emphatically deliver the services. These skills are learned and can be improved through appropriate training (Rodriguez and Gregory, 2005).

Unfortunately, the practice situation shows that only a small number of hotels in Romania focus on training, only 9.3% of all units that have performed such actions in 2012 were hotel. If we refer to all existing firms, hotels that have conducted courses have a share of only 3.7% (National Institute of Statistics-Tempo Online). Also, the international Travel & Tourism Competitiveness Report, 2013 (conducted by World Economic Forum) ranks Romania on position 109 (out of 140 countries included in the study) regarding the extent of staff training; this, of course is a negative situation.

Moreover Leiponen (2005) believes that hiring skilled employees may not be enough; employees also need to learn to use their skills within the organization.

Therefore, we expect that training core customer-contact employees for multiple skills can enhance both incremental and radical innovation among hotels:

H2: Training for multiple skills has a positive impact on (A) incremental and (B) radical innovation among hotels.

Besides the selection of right human resources and their training, it is critical to provide a support system to ensure smooth running of daily activities, the most important HRM practices being: empowering employees, promoting team spirit, creating an organizational culture as a means of showing the creativity an innovativeness of employees and ensuring appropriate technology and equipment.

Also, appropriate compensation of the best employees that have shown abilities to innovate is very important, especially given that the wages in the hospitality sector are low: in the period of January-September 2013, the lowest values of net nominal average earning were registered in hotels and restaurants (883 lei) (www.insse.ro). Reward systems currently applied does not cover assessment in the development of innovations, but other elements, such as sales or productivity. Of course, these are economic goals of any hotel, but as we said, in order to face the competition is necessary to innovate, so employees should be rewarded appropriately for developing radical innovation, and ideas to improve services rendered or delivery process (incremental innovation).

To retain the best employees is necessary to consider them as parts of the company vision. Front-office employees can carry out work only if they know company's vision and understand the role they plays in the organization and what is their involvement in pursuing its objectives in order to identify innovations. Such HRM practice translates into permanent contact with employees in order to communicate the overall vision of the company and listen to their requirements.

Equally important is treating employees like customers. Employees who feel they are valued for the work they perform and the company is interested in meeting their needs tend to keep their jobs. These arguments have led us to formulate the following hypothesis:

H3: Providing a support system that allows employees to smoothly carry out daily activities has a positive impact on (A) incremental and (B) radical innovation among hotels.

3. Research methodology

In the present study, the sample population is represented by hotel managers from Braşov County. To construct the sampling frame, we started from the data existing in the "List of classified tourist firms with accommodation functions" available online on Ministry of Regional Development and Public Administration website.

The research method used in this study was the survey based on a questionnaire, applied to the hotel managers. The method of applying the questionnaire was self-assisted Web. There were validated 60 questionnaires, resulting in the response rate of 68.20%.

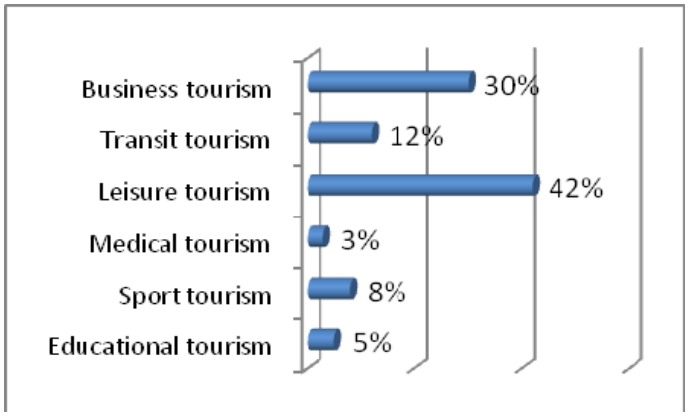
The questionnaire was designed to ask hotel managers for their opinions on the following variables: employee selection (5 items), training (5 items), support system for innovation (4 items), incremental innovation (4 items) and radical innovation (4 items). The first 3 variables deal with HRM practices and the other 2 deal with managers' orientation for innovating tourism products/services and/or delivery process. This information was collected using a five-point Likert scale (1-strongly disagree to 5-strongly agree) in response to statements about mentioned variables. The second part of the questionnaire contains factual questions that ask for identification data of the respondent and of the hotel he/she leads.

4. Results and findings

Regarding the characteristics of the respondents, on average, hotel managers have been in their present position for 7.4 years and in the hotel industry for 15.2 years; this implies they have experience with human resources management, so their answers are relevant.

On average, the hotels in the sample employed 98 people and offered for sale 170 rooms, 173 restaurant seats and 121 conference meetings seats. These characteristics are consistent with main market segments (Figure 1) targeted by hotels: leisure tourists (42%), business tourists (30%) and transit tourists (12%).

Figure 1- Market segments targeted by hotels



Source: Source: own projection

Most of hotels (52%) in the Braşov hotel sector have training plans, 22% of which are constant and 78% occasional. Internal training activities (88%) are more frequent than externally organized ones (12%). So, hotel managers prefer occasional and internal training than constant and external.

The first step of our analysis involves testing the adequacy of the measurement model by examining construct reliabilities. As presented in Table 1, all the coefficient alphas of constructs exceed the 0.70 level recommended by Nunnally (1978). Consequently, the reliability of the measurements is accomplished. More specifically, the coefficient alphas for: employee selection, training, providing a support system, incremental innovation and radical innovation are 0.86, 0.78, 0.81 0.75 and 0.72, respectively (Table 1).

Table 1 - Cronbach's coefficient alpha

Variable	**Number of items**	**α**
Employee selection	5	0.86
Training	5	0.78
Support system	4	0.81
Incremental innovation	4	0.75
Radical innovation	4	0.72

Source: Authors' calculations

Table 2 presents means, standard deviations (SD) and correlations among studied variables. We observe that hotel managers hire employees with multiple skills and qualifications (mean 4.55), offer training for basic skills (mean 2.48) and provide a support system at a medium level (mean 2.60).

Also, managers are more focused on developing incremental innovations rather than radical ones. Developing radical innovation (new services, products or provision systems) need high financial resources and we believe that hotel managers allocate them to other activities. Unlike manufacturing and other service sectors (telecommunications), that are known to release new products or services on a constant basis, the culture of innovation is quite different in the hotel sector. Thus, absence of new products and/or services does not mean that innovation does not take place, so we don't consider a negative situation regarding studied hotel management orientation.

Table 2 - Correlation matrix (p <0 .05)

Variable	**Mean**	**SD**	**1**	**2**	**3**	**4**	**5**
1. Employee selection	4.55	0.71	1.00				
2. Training	2.48	0.73	0.35	1.00			
3. Support system	2.60	1.00	0.37	0.42	1.00		
4. Incremental innovation	3.95	0.80	0.78	0.72	0.68	1.00	
5. Radical innovation	1.42	0.94	0.61	0.63	0.60	0.38	1.00

Source: Authors' calculations

Also, in Table 2 we observe positive correlation coefficients between variables, suggesting that the relationships are in the same direction. The lowest correlation coefficient was between employee selection and employee training (0.35), while the highest correlation coefficient was found in employee selection and incremental innovation (0.78).

This might be because incremental innovation may necessitate less knowledge of employees, and thus the intensive investment in hiring and training high-quality employees might not entirely pay off, especially when the hotel take into consideration both approaches. However, radical innovation may require more expertise and thus the two HRM practices may be both useful, although we find no strong correlation.

Table three summarizes the multiple regression results. We observe that there is a positive impact of each dimension of the human resources management practices included in the regression model.

Table 3 - Multiple regression analysis results (p <0.05)

Variable	Incremental innovation	Radical innovation
Employee selection	0.458	0.644
Training	0.235	0.223
Support system	0.678	0.072

Source: Authors' calculations

We observe that multi-skilled employee selection in studied hotels has a positive and significant impact upon incremental and radical innovation, providing support for H1. In other words, we consider that managerial approach “hire for attitude and train for skill” is not advisable.

Also, in table 3 we observe that training for basic skills has a positive, but non-significant impact on incremental and radical innovation. Thus, Hypothesis 2 was marginally supported. The tourism sector continuously evolves, so specialized training is a mandatory HRM practice. Moreover, we consider that specialized trainings are not only important in the innovation decision but also in its intensity. Without a doubt, when hotel managers use this type of human resources practice, the probability to develop more innovation to offer better services increase a lot.

Providing a support system for employees’ daily activities has a significant impact on incremental innovation and a positive, but non-significant impact on radical innovation. Thus, Hypothesis 3 was marginally supported.

The results in Table 3 suggest that hiring multi-skilled customer-contact employees might have a stronger impact on both incremental and radical innovation among hotels than training customer-contact employees for basic skills.

5. Conclusions

In this study, we take a broader view of the benefits of three HRM practices on developing and implementing hotel innovation. The study's concluding remarks are as follows.

First, if the ultimate goal of a hotel is to promote radical innovation, then using both hiring multi-skilled customer-contact employees and then training them is suggested. If, however, the ultimate goal is to promote incremental innovation, then the hotel should consider hiring multi-skilled customer-contact employees and provide a support system that allow them to efficiently carry out daily activities; this situation would create a appropriate environment for creativity, flexibility and motivation to find different ways to improve the tourism products/services provided or the system of provision. Being aware of the existence of a team and a system to support them, they will be able to focus on developing innovations, but also to ensure a high quality of services for the tourists.

Second, it is interesting to note that some hotels still have a traditional approach to manage employees (treat employees as a cost rather than asset) and provide only limited training for them.

Another main conclusion is the importance to consider the employment skills in this labor intensive sector in which these skills are key determinants of the hotels competitive advantage and performance. Innovation activity is supported by the use of some human practices as hiring multi skilled employees. Also hotel managers should take into the necessity to permanent specialized training in order to introduce innovations to improve quality in the provision of tourism services.

We conclude that HRM practices are feasible tools for promoting incremental and radical innovation among hotels. But, as a limitation of our study, we note that we didn’t look at the effects of innovation on hotel performance, especially on financial one. Future studies could continue to explore the implications of incremental and radical innovation on the long-term financial performance of hotel companies.

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SELECTED SOCIAL MEDIA ANTECEDENTS: ATTITUDES TOWARDS AND BEHAVIOURAL IMPACTS ON ITS USAGE AMONG CONSUMERS IN A DEVELOPING COUNTRY

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Abstract: This study examined the relationship between selected antecedents, attitude and behavioural intentions towards social media usage in South Africa. A quantitative approach was adopted and questionnaires administered to 376 consumers. The reliability of the measuring instrument was tested through Cronbach's coefficient alpha. A four-factor structure was established using Principal Component Analysis with Varimax rotation. Non-parametric correlations and regression analysis were used to test for any predictive relationships among the variables in the proposed conceptual model. Perceived ease of use, perceived enjoyment and perceived critical mass were supported as the underlying antecedents of social media usage. Attitude was also found to influence consumers' intentions to adopt social media technologies. These findings imply that an understanding of the fundamental antecedents of social media acceptance could enable marketing organisations to satisfy the particular needs of desired markets, whose motivations vary by individual, setting and context.

JEL Classification: M220

Keywords: social media antecedents, attitude, behavioural intentions

1. Introduction

As new marketing channels and technology formats continue to develop and secure their positions among global markets, an increasing reliance on social media by consumers of social networking and content sharing has been observed (Asur and Huberman, 2010). Between 2008 and 2011, over 75% of the world's

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Internet users used social media by joining social networks, blogging and contributing to reviews on shopping sites (Forrester Research, 2012). Consequently, traditional advertising budgets for most marketing organisations have been significantly curtailed, with an evident increase in advertising costs expended in the Internet arena (Baker et al., 2013). Social media represents a revolutionary platform for fast-changing public discourse and agendas from topics ranging from the environment (McKenzie et al., 2009) to economics (Weber, 2009), politics (Eley and Tilley, 2009, entertainment (Asur and Huberman, 2010), health (Thackeray et al., 2008) and sports (Weber, 2009), *inter alia*. Invariably, ease of use, speed and the proliferation and wide reach of social media have enabled this prodigy to mutate as an effective tool for marketing and advertising products and services. Albeit, this overarching influence of social media has, by and large, not escaped South African businesses and consumers.

Historically, Internet websites presented static, one-way communication through Web 1.0 applications. These offered stagnant, less interactive pages that communicated marketing messages to the public in a unilateral direction (Weber, 2009). Social media or social software has been developed through Web 2.0 (second generation of Internet-based applications). The consumer is in control of how information is generated, created, organised and shared. Online content comprises two-way communication through social networks (Warr, 2008); text chat and forums (Asur and Huberman, 2010); social bookmarking through product ratings (Tepper, 2003); liking/s, online reviews and tagging (Hoffman and Fodor, 2010); the generation of online content referred to as collective intelligence (Dawson, 2007); collaborative projects such as Wikipedia (Kaplan and Haenlein, 2010); blogs or special websites with date-stamped entries (OECD, 2007); user-generated content communities such as YouTube, Slideshare and Flickr used for sharing media content (Weber, 2009); virtual game worlds such as Microsoft's X-box and Sony's Playstation; and virtual social world applications that are widely used by clothing and furniture marketers to promote their designs (Kaplan and Haenlein, 2009).

There has been no singular definition of social media that has been arrived at by managers or academics. However, the term was conceived after the era of open diary, an online community social networking site of diary writers (Kaplan and Haenlein, 2010). This period was closely followed by weblog in 1979, a community of online bloggers, leading to the creation of MySpace in 2003 and Facebook in 2004. This, together with virtual worlds, led to the coining of the term social media.

Koo et al. (2011) suggest that social media is a social communication technology that encompasses a broad range of e-WOM forums including blogs, company-sponsored discussion boards, chat rooms, consumer-to-consumer emails, consumer product or service ratings websites and Internet discussion forums. These eWOM contents are argued to be more effective than conventional promotional tools and commercial Internet advertising (Cheung et al., 2003). On the other hand, Baker et al. (2013:34) define social media as "the use of portals such as social networks, online communities, blogs, wikis or other online collaborative media for marketing, sales, public relations and improving customer service". These platforms facilitate a viral replication of messages through business-to-user contact (Kim et al., 2009), user-to-user contact (Trusov et al., 2008), brand communities (Weber, 2009) and online social conversations/dialogue (Asur and Huberman, 2010). Customers set the rules of engagement and electronic word of mouth (eWOM) either makes or breaks a product/brand (Tepper, 2003). This is because the social structure of

online communities follows a typical pattern: more experienced members serve as experts and leaders by educating others about products, brands and services (Blackshaw and Nazzaro, 2006) and newer members try to find advice and information (Weber, 2009). This presents consumers who have no special knowledge with an opportunity to become active participants, co-creators and modifiers of online marketing information (Kaplan and Haenlein, 2010). For the purpose of this study, the definition of social media shall encapsulate all the aforementioned World Wide Web (www)-based applications that build on the "ideological and technological functionalities of web 2.0", as suggested by (Kaplan and Haenlein, 2010:62).

Underlying theoretical context of the study: The inquiry as to what factors contribute to attitudes and behavioural intention to use Internet technology, or more precisely, social media, is important. A variety of theoretical frameworks have been used by previous scholars to explain user acceptance of technology, such as Roger's Innovation Adoption theory (Rogers, 1995), theory of planned behaviour (TBP) (Fishbein and Ajzen, 1975), theory of reasoned action (TRA) (Ajzen, 1985), as well as the technology acceptance model (TAM) (Davis et al., 1989).

TAM has received considerable attention from researchers in the information systems discipline because of its high validity across a wide spectrum of contexts and applications, including micro-computing (Igbaria, Parasuraman, Baroudi, 1996), telemedicine (Hu et al., 1999), professional health care (Chau and Hu, 2002) and online games (Hsu and Lu, 2004). Bagozzi (2007) identifies TAM as the leader-model which provides parsimonious, explanatory variables that seek to establish the consciously intended adoption behaviours of consumers. It is against this backdrop that TAM (Davis, 1989), social influence theory (Fulk, 1993) and the critical mass theory (Markus, 1987) are used as the underlying frameworks upon which the current study is premised.

2. Proposed relationships and hypotheses formulation for the study

TAM focuses on the attitudinal explanations of intention to use a specific technology or service (Davis, 1989, Davis et al., 1989). The model posits two primary attitudinal determinants namely, perceived ease of use (PEOU) and perceived usefulness (PU), for a specific application system and highlights relationships among attitudes and intention to use the application (Venkatesh, 2000).

Perceived ease of use (PEOU)

PEOU is defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989:320). Users are more likely to demonstrate positive behavioural intentions to use an application that is generally considered as being user-friendly (Cheung et al., 2003). The findings of a study conducted by Venkatesh (2000) reveal that PEOU is the underlying dimension that influences positive attitudes and continuation in the usage of technologies among users. Therefore, these findings suggest that ease of use is an important antecedent of attitude towards social media technologies.

Perceived usefulness (PU)

Perceived usefulness (PU) is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Bhattacherjee and Sanford, 2006:810). This implies that a system can be used advantageously and that the user believes in the existence of a positive user–performance relationship (Mathieson, 1991). Consequently, consumers are willing to spend more hours on Internet technologies which they consider as contributing positively towards their performance. Past research has identified positive relationships between the perceived ease of use (PEOU) and the perceived usefulness (PU) constructs with attitude towards technology usage (Chen et al., 2002; Lou et al., 2000; Lin and Lu, 2000). Cha (2010) found that interpersonal utility, perceived ease of use and perceived usefulness determine the actual use (and frequency) of the tools that deliver social media, social networks in particular. In contrast, Turner et al. (2010), in their review of literature on TAM, gathered evidence that TAM's variables PEOU and PU are associated with attitude and not so much with actual technology usage.

Drawing on the definitions of these two internal beliefs in Davis (1989), PEOU and PU are defined in this study as "the extent to which a person believes that using social media platforms will be free from difficulty or intense usage effort" and "the degree to which a consumer believes that using social media platforms will enhance his/her attitude and ultimate purchase performance decisions and activities" respectively. Based on the valid prescriptions of the TAM, the following hypotheses are formulated for the study:

H_1: Perceived usefulness of social media is positively related to the attitude of consumers towards social media

H_2: Perceived ease of use of social media is positively related to the attitude of consumers towards social media

The TAM is constricted in that although it may be widely accepted in new technology acceptance studies, it omits social structure and related influences as a significant variable for consideration (Hossain and de Silva, 2009). Furthermore, users' perceptions of enjoyment (PET) and perceived critical mass (PCM) have been disregarded although a plethora of arguments can be posited in support of the inclusion of PET and PCM in technology-acceptance research based on positive relationships that were previously established between these constructs and attitude towards social media technology (Yang and Choi, 2001).

Perceived enjoyment of technology (PET)

Teo et al. (1999) corroborated the inclusion of perceived enjoyment (PET) in studies on technology acceptance. The importance of this variable can be explained with reference to existing literature on enjoyment as an explanatory variable which has considerable bearing on what propels Internet technology usage (Bruner and Kumar, 2005). For instance, studies of Van der Heijden (2004) as well as Hsu and Lin (2008) demonstrate that the hedonic aspect of using Internet technology may suggest that enjoyment is the dominant predictor of intentions to use that particular technology. Empirical support for strong positive relationships between perceived enjoyment (PET) and user acceptance of Internet technology is

provided in the literature (Teo et al., 1999; Venkatesh, 2000; Venkatesh et al., 2002). Additionally, PET may be generated in the process of performing the activity through interpersonal relationships among the users (Davis et al., 1992). In this respect, PET is a form of intrinsic motivation which indicates that an individual conducts an activity for its own sake, deriving fun, enjoyment and pleasure from it (Igbaria et al., 1996). These attributes are inherent both in various social media tools and in their usage *per se* (Venkatesh et al., 2002).

Perceived critical mass

Based on critical mass theory espoused by Markus (1987) and social influence theory (Fulk, 1993), perceived critical mass is believed to have a direct effect on technology acceptance, adoption and usage. The direct effect has been examined and found to be statistically significant in several empirical studies (Soe and Markus, 1993; Lou et al., 2000; Hsu and Lu, 2004). In social science, critical mass was originally referred to as "a small segment of the population that chooses to make big contributions to the collective action" (Oliver, *et al.,* 1985:524). This implies that a minimal number of adopters of an interactive technology such as social media should be present for the technology to realise further positive behavioural impacts from the users.

Unlike traditional information technologies, social media require collective efforts and interdependence between two or more people and this is fostered through conversation and sharing (Markus, 1987). The benefits of using social media can therefore be derived in the presence of social presence and the networking community (Li et al., 2005). Further empirical evidence points to positive and statistically significant relationships between perceived critical mass (PCM) and behavioural intention to use Internet technology (Luo et al., 2000; Li et al., 2005). Marku's (1987:503) theory points to some individuals who have "the personal characteristics of being sought after" by other people. These individuals may be used as a reference point by other individuals who may consequently exhibit positive attitudes towards social media, thus creating a good atmosphere for using the communication technology. PCM would therefore be a relevant antecedent of social media technology acceptance because if an individual perceives that many reference groups are using social media, or these groupings suggest the use of such tools, the individual may have a positive attitude and eventually decide to use the technology.

In the current study, PET and PCM are defined respectively as "the degree to which social media tools are perceived as providing internal gratification, pleasurability and enjoyment, which logically delivers an impetus for consumers to reflect positive attitudes toward social media tools" and "the degree to which a perception of the minimum number of current users existing on social media platforms will influence attitude towards the technology". However, based on the guidelines of social influence theory and critical mass theory, the following hypotheses are formulated for the study:

H_3: Perceived enjoyment of social media by consumers is positively related to their attitude towards social media

H_4: Perceived critical mass of social media is positively related to the attitude of consumers towards social media

Attitude and behavioural intentions

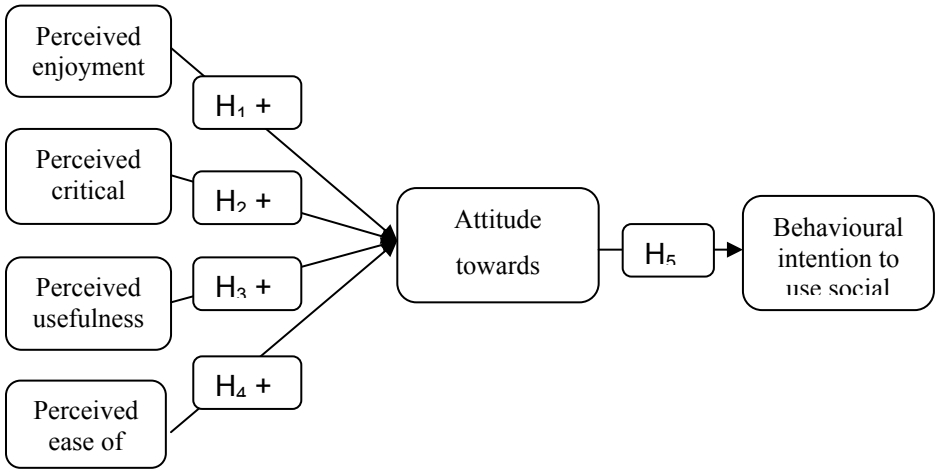
Studies on the acceptance of social media solicit an understanding of the target audience's attitudes towards the value of social media tools as a source of consumer information. Attitude relates to the personal evaluation of a particular entity with some degree of 'favour' or 'disfavour' as this will have a bearing on the purchase behaviour of users regarding various marketing messages sent and received through social media platforms. Similarly, attitude (ATT) towards the particular technology will predict the individual's behavioural intention (BI) and ultimately lead to actual usage of the technology under review (Mathieson, 1991).

Attitude (ATT) toward an innovation is a critical intervening variable in innovation adoption decisions (Rogers, 1995). In accordance with Ajzen (1991) on the theory of reasoned action, the current study proposes the inclusion of ATT and BI in the study of social media behavioural impacts. ATT and BI are defined as "a consumer's assessment of the desirability of using social media technology" and "the consumer's intention to perform a given behaviour using social media technology" respectively. It is against this background that a positive relationship is expected between attitude and intention to use social media technology.

H_5: The attitude of consumers towards social media is positively related to the behavioural intentions to use social media

Based on these hypotheses, the following research model is proposed, as depicted in Figure 1. The proposed research model suggests that attitude is a function of PEOU, PU, PET and PCM. Furthermore, attitude is a crucial determinant of behavioural intention to use social media technology among South African consumers.

Figure 1 Proposed research model



Purpose of the study

The purpose of this study was to extend the TAM to include the influence of selected antecedents, perceived enjoyment (PET) and perceived critical mass (PCM), on South African consumers' attitude and behavioural intention to use social media.

Problem under investigation

In South Africa, **s**ocial media has evolved from being an untapped phenomenon to a buzzword among both companies and academics alike. Numerous publications on social media antecedents in developing countries exist, although a majority of these studies are preliminary benchmarks, theoretical reviews or market studies, which do not provide deeper insight into technology acceptance issues. This may be because most companies are either not sure about how they can quantify the returns that have been realised from social media platforms or they have fallen short regarding the development of an adaptable social media marketing strategy (Mangold and Faulds, 2009). Furthermore, researchers may be sceptical about the significance of social media technologies in the consumer market of developing countries. Unquestionably so, social media acceptance has proliferated among individual consumers (Eley and Tilley, 2009).

Most of the previous studies concentrated on investigating the subject of information systems acceptance based on the perspective of the technology user by applying traditional adoption theories such as TAM and TRA (Fishbein and Azjen, 1985; Davis, 1989; Davis et al., 1989). Nonetheless, limited research on the antecedents of social media has been conducted in a developing country context (Trusov et al., 2008; Hossain and De Silva, 2009; Kaplan and Haenlein, 2010; Colliander and Dahlen, 2011). To date, the degree to which Web 2.0 social media applications will transform marketing promotion and expand consumer capabilities remains unknown (Thackeray et al., 2008). This has unequivocally led to a dearth in the body of knowledge that is aligned towards identifying the salient antecedents of social media acceptance by consumers in South Africa. The rise in the usage of social media platforms, coupled with consumers' attitudes towards them and their behavioural impact, is, therefore, a worthy subject of research.

3. Research Design

A quantitative research design was followed in the study as this was necessary to examine the relationship between the constructs used in the study. A survey method was chosen because of its suitability as a data collection method for obtaining attitudinal data (Dooley, 2001).

Sample

A non-probability purposive sampling method was used in the study. In a purposive sample, the sample elements are selected because "it is expected that they can serve the research purpose" (Churchill and Iacobucci, 2002:98). Consistent with studies of *Li* et al. (2005), Hsu and Lin (2008) and Shih (2004), a purposive selection of 500 consumers was solicited for this survey. This figure is also consistent with minimum sample sizes for quantitative consumer surveys (Avkiran, 1994:12). Data were collected from undergraduate students from the Faculty of Management Sciences in a university in Southern Gauteng, South Africa. The survey was conducted in March 2013. Students were requested to complete the questionnaires voluntarily and submit them to their class lecturers. The data collection took place over eight weeks. The sample was homogeneous in terms of demographic features such as age and types of courses offered in the faculty.

Operational measures and measurement instruments

Operational measures for the various scales were adopted from previous studies and the items, anchored at 1 (strongly disagree) to 7 (strongly agree), were slightly modified to make them more applicable in the context of social media. The scale items for perceived ease of use, perceived usefulness, attitude and behavioural intention to use social media tools were adapted from the reliable scales of Hsu and Lin (2008); Shih (2004) and Davis (1989). Perceived enjoyment was measured by items adapted from Venkatesh et al. (2002). Perceived critical mass was measured using the adapted scales of Lou et al., (2000) and Hsu and Lu (2004), whereas measures of attitude and behavioural intentions were adapted from the scales of Agarwal and Karahanna (2000) and Davis et al. (1992).

An accompanying letter highlighting the purpose of the study was attached to the questionnaire, which was reviewed by two experts in the field of marketing and social media. A convenience sample of 50 students was used to pre-test the questionnaire. Debriefing occurred thereafter and changes in rephrasing, sequence and layout were made to questions.

Data collection

Of the 500 respondents sampled, 124 questionnaires were either returned incomplete or considered invalid, resulting in 376 questionnaires retained and considered usable for the study. Ethical considerations that were incorporated include informed consent and protection from discomfort, harm and victimisation whereby the respondents were given the opportunity to withdraw from the study at any stage. The responses of the participants were also kept confidential and their names were kept anonymous at all times during the data collection process.

Assessment of reliability and validity

The reliability of the entire social media instrument was ascertained by computing the Cronbach alpha coefficient values. According to Nunnally (1978), Cronbach's alpha coefficients of less than 0.60 are deemed unsatisfactory. Alpha values between 0.60 and 0.69 are deemed acceptable while values above 0.70 are regarded as highly acceptable. The sub-scale reliability values ranged between 0.729 (perceived critical mass), 0.812 (attitude), 0.830 (behavioural intentions), 0.833 (perceived usefulness), 0.855 (perceived ease of use) and 0.858 (perceived enjoyment of technology). Moreover, the standardised Cronbach's alpha value for the entire scale was established at 0.879, a satisfactory indication of internal consistency. These results therefore provide sufficient evidence to suggest that the instrument that was used in the current study was able to capture all the elements that were fundamental towards unveiling the social media acceptance determinants among South African consumers.

Content validity was assessed through a pilot study and a pre-testing exercise prior to the main administration of the questionnaire. This served to ascertain that the questionnaire used in the main survey would validly capture the information sought by the researchers (Sudman and Blair, 1998). Discriminant validity was assessed through exploratory factor analysis on all the four antecedents of social media as well as attitude and behavioural intention to use social media. The results of this study indicate that an operation is similar to (converges on) other operations that it theoretically should be similar to on the factor loadings; hence four antecedents were identified. The factor loadings are shown in table 1 of this study.

Convergent validity was also assessed through an analysis of the Cronbach alpha values. The high alpha values (≥0.70) reflect the degree of cohesiveness among the scale items, serving as an indirect indicator of convergent validity (Nunnally and Bernstein, 1994). The degree of convergence was further assessed through a computation of correlation coefficients, as shown in table 2 of this study. Positive correlations on the social media antecedents indicate a high degree of convergence among three of the four social media antecedents. Additionally, predictive validity was assessed through regression analysis and causality was explained by three of the identified antecedents of social media acceptance, namely PET, PCM and PEOU. Furthermore, the attitude construct was validated as having a causal relationship with behavioural intentions to adopt social media by consumers in this study.

Profile of respondents

The demographic characteristics of the respondents indicate that there were 219 male respondents (58% of the sample) and 157 female respondents (42% of the sample) in the survey. The largest group, comprising 191 respondents (40% of the sample), was aged 22–25 years. With regard to ethnicity, 325 respondents were of African (black) orientation (86% of the sample), 19 (5% of the sample) were from a white background, 7 were of Indian descent (2% of the sample) and 25 were coloured (7% of the sample).

A majority of the respondents (249 respondents; 66% of the sample) concurred that the mobile phone was their main access point for social media networks. The least popular Internet access points for social media and networks were the university Internet (18% of the sample), home Internet (10% of the sample) and Internet cafés (6% of the sample). Similarly, the respondents were asked to indicate their level of usage of social networking tools. A majority of the respondents (240 respondents; 64% of the sample) highlighted that they have access to social media networks on a daily basis, indicating that the profile of the respondents involved in the current study were regular users of social networking tools. This unrestricted usage of social media platforms was further supported by the responses provided to the question pertaining to the average amount of time per day spent on social networking platforms.

4. Data analysis

Factor structure of the social media antecedents

xploratory factor analysis was carried out with a view to condensing the experimental variables into identifiable factors. The principal component analysis method was utilised, while the rotation method was Varimax rotation with Kaiser Normalization. The Bartlett's test was significant at $p<0.000$, implying that the data set is not an identity matrix with zero correlations (i.e. variables are correlated), thus confirming that a factor analysis procedure could be applied in the study. Moreover, the Bartlett's test produced a chi square value (χ^2) of 3753.686 and a KMO value of 0.748 (>0.50), further confirming appropriateness of the data set for factor analysis. The total variance explained by the extracted factors is 66.5%, indicating that the other 33.5% is accounted for by extraneous variables that do not constitute part of this study. The results of the rotated component matrix, percentage of

variance explained by each factor, cumulative percentage of variance and eigenvalue criterion guided the extraction of factors. These psychometric properties are reported in table 1.

Through Varimax rotation, a clear factor structure with 18 items that loaded on four factors was established. These factors were labelled perceived enjoyment of technology (PET), perceived ease of use (PEOU), perceived usefulness (PU) and perceived critical mass (PCM). Thus, these four factors were considered as relevant to the extracted constructs presented as the underlying antecedents of social media acceptance among South African consumers.

Table 1: Rotated factor loading matrix of the social media scale

Rotated Component Matrix[a]				
	Component			
Scale Description	**1 Perceived enjoyment of technology (PET)**	**2 Perceived ease of use (PEOU)**	**3 Perceived usefulness (PU)**	**4 Perceived critical mass (PCM)**
Participating in social media gives me pleasure	**.588**	-.199	-.017	.416
Participating in social media is fun	**.838**	-.042	-.100	.082
Participating in social media is appealing	**.595**	-.166	.014	.414
Participating in social media is exciting	**.846**	-.078	.179	.116
Participating in social media is enjoyable	**.803**	.209	-.045	.146
Participating in social media is entertaining	**.784**	.161	.037	.044
My participation in social media depends on what my colleagues think	.211	.009	.003	**.606**
My participation in social media depends on encouragement from people who are important to me	.088	-.092	.229	**.681**
My participation in social media depends on what my friends think	.039	-.020	-.004	**.824**
My participation in social media depends on whether most people in my community use the tools	.217	.020	-.100	**.736**
Using social media tools would improve my work/learning/life performance	-.056	.254	**.842**	-.005
Using social media tools would enhance my work/learning/life effectiveness	.051	.107	**.920**	.038
Using social media tools would enhance my work/learning/life productivity	.044	.194	**.851**	.089
Learning to use social media tools is easy for me	.293	**.666**	.113	.099

Rotated Component Matrix[a]				
	Component			
Scale Description	**1 Perceived enjoyment of technology (PET)**	**2 Perceived ease of use (PEOU)**	**3 Perceived usefulness (PU)**	**4 Perceived critical mass (PCM)**
Social media tools are clear and understandable to use	-.135	**.766**	.307	-.294
Overall, I believe social media tools are easy to use	-.008	**.853**	.219	-.139
Participating in social media platforms would not require a lot of mental effort	-.135	**.682**	-.082	.242
Social media tools are flexible to interact with	.059	**.711**	.365	-.231
Explained variance	**20.074**	**16.654**	**14.900**	**14.868**
Cumulative % of variance	**20.074**	**26.728**	**51.628**	**66.495**
Eigen Values	**4.503**	**4.009**	**1.917**	**1.539**
Mean Scores	**5.602**	**5.334**	**5.123**	**5.502**

**Loadings of 0.50 and more were considered significant. Extraction method: Principal Component Analysis. Varimax rotation with Kaiser Normalization.*

Factor one, labelled perceived enjoyment of technology (PET), comprised six variables and accounted for 20.07% of the variance. The eigenvalue was 4.503. High factor loadings were obtained on the PET sub-scale, ranging between .588 and .846, thus confirming the internal validity of the factor. PET is seen as an intrinsic motivation offering the respondents a sense of personal gratification while using social media. This finding is supported by other researchers (Teo et al., 1999; Venkatesh et al., 2002; Van der Heijden, 2004). Factor two, labelled perceived ease of use (PEOU), comprised five variables and accounted for 16.65% of the variance. The eigenvalue was 4.009. High factor loadings were obtained on the PEOU sub-scale, ranging between .666 and .853, confirming the internal validity of the factor. The items that loaded on this factor relate to respondents' perceptions of whether using social media platforms is free of physical, mental and learning effort. Accordingly, respondents are bound to show a positive attitude towards social media, considering its overall user-friendliness (Mangold and Faulds, 2009; Hossain and De Silva, 2009). Factor three, labelled usefulness (PU), comprised three variables and accounted for 14.90% of the variance. The eigenvalue was 1.917. High factor loadings were obtained on the PU sub-scale, ranging between .842 and .920, confirming the internal validity of the factor. Past research has confirmed PU as being the dominant variable influencing attitude towards various new technologies (Lin and Lu, 2000; Chen et al., 2002). Factor four, labelled perceived critical mass (PCM), comprised four variables and accounted for 14.86% of the variance. The eigenvalue was 1.539. High factor loadings were obtained on the PCM sub-scale, ranging between .606 and .824, confirming the internal validity of this factor.

5. Discussion

In order to examine the relationship among the variables in study, Spearman's rho (*r*) was computed. This correlation test statistic is used to describe the existence of a relationship among the constructs as well as the strength and direction of the association. In terms of the relationship between the four social media acceptance sub-scales and attitude, positive correlations were recorded on only three of the four dimensions, namely, PET, PCM and PEOU. Thus, high levels of convergence exist between PET, PEOU and PCM with attitude. However, it is interesting to note that in the current study no significant relationship was established between the perceived usefulness dimension and attitude. The results are reported in Table 2.

Positive and strong associations were established between consumer attitudes towards social media and behavioural intentions to use the media technologies (r=0.472; p<0.01). These findings are consistent with similar technology acceptance studies. Previous research consistently reports a strong positive interconnection between perceived enjoyment (Teo et al., 1999; Venkatesh et al., 2002), perceived critical mass (Lou et al., 2000; Li et al., 2005) and perceived ease of use (Lin and Lu, 2000; Venkatesh, 2000) with attitudes, and the latter with behavioural intentions (Davis et al., 1989).

Table 2 Correlation analysis of the social media acceptance dimensions with attitude and behavioural intentions

Construct/Dimension	PET	PCM	PEOU	PU	ATT	BI
Perceived enjoyment (PET)	1	.429**	.025	-.057	.527**	.246**
Sig		.000	.627	.267	.000	.000
Perceived critical mass (PCM)	.429**	1	.065	-.128*	.411**	.115**
Sig	.000		.206	.013	.000	.026
Perceived ease of use (PEOU)	.025	.065	1	.431**	.122*	.364**
Sig	.627	.206		.000	.018	.000
Perceived usefulness (PU)	-.057	-.128*	.431**	1	-.015	.458**
Sig	.267	.013	.000		.769	.000
Attitude (ATT)	.527**	.411**	.122*	-.015	1	.472**
Sig	.000	.000	.018	.769		.000
Behavioural intentions (BI)	.246**	.115*	.364**	.458**	.472**	1
Sig	.000	.026	.000	.000	.000	

* Correlation is significant at the 0.05 level (2-tailed).** Correlation is significant at the 0.01 level (2-tailed)

Since the relationship between social media acceptance dimensions and consumer attitudes showed positive correlations with three antecedents, regression analysis was conducted to establish whether or not causality exists between these predictors (social media antecedents) and their relative measurement response (attitude). Also, causality was tested between attitudes as a mediating variable with behavioural intentions to adopt social media technology.

The Durbin-Watson test statistic was assessed to test for autocorrelation in the residuals on a regression analysis procedure (Durbin and Watson, 1950). As a rough rule of thumb, if Durbin-Watson is very small ($d \leq 1$) there may be cause for alarm; small values ($1 < d < 2$) indicate that successive error terms are close in value to one another or positively correlated, and large values ($d > 2$) suggest that successive error terms are very different in value from one another, i.e. negatively correlated.

The correlation matrix was examined for existence of multicollinearity, i.e. if the predictor variables correlate too highly ($r > 0.9$) with each other (Field, 2005). None of the correlations in table 2 reached a value of $r > 0.9$, hence the data were considered suitable for linear regression analysis using the enter method.

Assumptions of the regression models were checked along with collinearity diagnostics. It is recommended by Field (2005) to consider linear regression analysis where the variance inflation factor values (VIF) fall below 10 as this indicates that the predictor variables are not highly correlated among themselves. Moreover, tolerance levels that are above 0.2 specify that the data set has limited potential of bestowing collinearity problems. In the current study, the regression model was deemed appropriate for the data as the VIF ranged from 1.000 to 1.267 and the tolerance statistics for the predictor variables ranged from 0.816 to 1.000, implying that there was no collinearity within the data set (refer to table 3 and table 4).

Table 3 Regression analysis: Social media acceptance antecedents and attitude

Independent variables: Social Media acceptance	Dependent variable: Attitude				
	Standardised Coefficients	T	Sig.	Collinearity Statistics	
	Beta			Tolerance	VIF
Perceived enjoyment of technology (PET)	.430	9.136	.000	.816	1.226
Perceived critical mass (PCM)	.220	4.602	.000	.793	1.261
Perceived ease of use (PEOU)	.117	2.081	.038	.799	1.251
Perceived usefulness (PU)	-.005	-.103	.918	.789	1.267
Model 1 Summary: R= 0.574 R^2 = 0.329 Adjusted R^2 = 0.322 Std. error of the estimate = .94386 F change = 45.536					

The regression analysis revealed that the four social media antecedents (adjusted R^2 = 0.322) explain approximately 32% of the variance in overall social media acceptance among South African consumers. Additionally, a Durbin-Watson autocorrelation test statistic of 1.525 was established, indicating positive autocorrelation or a perfect estimation of the level of statistical significance in the regression model. Furthermore, a large F statistic was obtained on the regression model at a value of 45.536 (p=0.000), thus confirming the fitness of the regression model in measuring causality between the social media antecedents and attitude.

In terms of the perceived usefulness antecedent, no statistically significant results were established with attitude (β = -0.005; *t* = -0.103; *p* > 0.05). Furthermore, PU was ranked fourth (last) on the mean score rankings ($\bar{x}$ =5.123), indicating minimal levels of agreement on its contribution in shaping consumers' attitudes to social media acceptance. An examination of the correlation coefficients further revealed negative and insignificant results (*r*= -0.015). These results suggest that H_1 is not supported and is, therefore, rejected in this study. These findings are contrary to previous technology acceptance studies (Lou et al., 2000; Lin and Lu, 2000; Chen et al., 2002; Cha, 2010).

Perceived usefulness is a construct that measures how people believe their productivity and effectiveness has been improved through the adoption of new technologies. Hsu and Lin (2008) assert that this dimension is more relevant to work-related situations and less applicable during online purchase decisions, social networking and other consumption decisions that are taken using social media platforms. Moon and Kim (2001) further contend that PU is a "job-related or business-related utility generated through adopting and using a type of information technology in the work environment". Similarly, in the current study, PU is rejected and cannot be supported as a valid antecedent in the context of social media acceptance.

In terms of the perceived ease-of-use antecedent, positive and statistically significant results were established with attitude (β = 0.117; *t* = 2.081; *p* < 0.05). Furthermore, PEOU was ranked third on the mean score rankings ($\bar{x}$ =5.334), indicating high levels of agreement on its contribution in shaping consumers' attitudes to social media acceptance. An examination of the correlation coefficients further revealed positive and significant correlations with attitude (*r*=0.122). These results suggest that H_2 is supported and is, therefore, accepted in this study. These findings accord with previous social media studies (Chen et al., 2002; Cheung et al., 2003; Colliander and Dahlen, 2011). All other things being equal, consumers exhibit a positive attitude towards new technologies when using the system is considered as effort-free. This demonstrates the extensive effort social media system developers should expend in developing user-friendly interfaces on social media as this construct determines whether or not there will be increased participation on such platforms.

In terms of the perceived enjoyment of technology antecedent, positive and statistically significant results were established with attitude (β = 0.430; *t* = 9.136; p < 0.01). Furthermore, PET was affirmed as the highest rated antecedent of social media acceptance after being ranked highest on the mean score rankings ($\bar{x}$ =5.602) and also revealing strong, positive and significant correlations with attitude (*r*=0.527). These results suggest that H_3 is supported and is, therefore, accepted in this study. These findings concur with previous social media studies (Colliander and Dahlen, 2011; Hsu and Lin, 2008; Teo et al., 1999). These scholars assert that consumers perform certain behaviour on social networking platforms in order to experience pleasure and satisfaction which is inherent in the activity. Users of technology prioritise enjoyment when making adoption decisions. Using the social media platform should be enjoyable in its own right, aside from the instrumental value of the technology (Davis et al., 1992). In this study, the enjoyment derived from using social media technology to interact with network partners has been established as being the most salient antecedent of social

media acceptance because of the high Beta value and the strong correlation coefficient. This means that if consumers do not perceive social media as enjoyable, they will not participate in the networking platform, which is hardly surprising. Therefore, marketers and software designers should consider joy of use and the hedonic qualities when developing contemporary social media technologies.

Regarding the perceived critical mass antecedent; positive and statistically significant results were established with attitude (β = 0.220; *t* = 4.602; p<0.01). Furthermore, PCM was ranked second on the mean score rankings ($\bar{x}$ =5.502), indicating high levels of agreement on its contribution in shaping consumers' attitudes to social media acceptance. An examination of the correlation coefficients further revealed strong, positive and significant correlations with attitude (*r*=0.411). These results suggest that H_4 is supported and is therefore, accepted in this study. These findings are supported in literature (Lou et al., 2000; Yang and Choi, 2001; Koo et al., 2011). In the current study, if an individual perceives that many online network members are using social media, or these network members suggest the use of social media, the individual may perceive social media to be an acceptable platform for purchasing and communicating product and brand information.

Additionally, the linear regression procedure was applied to establish the predictive validity between attitude and behavioural intentions constructs, as highlighted in table 4. The regression analysis revealed that attitude (adjusted R^2 = 0.221) explained approximately 22% of the variance in consumers' behavioural intentions to adopt social media. Additionally, a Durbin-Watson autocorrelation test statistic of 1.681 was established, indicating positive autocorrelation or a perfect estimation of the level of statistical significance in the regression model. Furthermore, a large F statistic was obtained on the regression model at a value of 107.134 (p=0.000), thus confirming the fitness of the regression model in measuring causality between consumers' attitude towards social media and behavioural intentions to adopt social media technologies.

Table 4 Regression analysis: Attitude and behavioural intentions to adopt social media

Independent variables: Attitude toward social media (ATT)	Dependent variable: Behavioural Intentions (BI)				
	Standardised Coefficients	T	Sig	Collinearity Statistics	
	Beta			Tolerance	VIF
Attitude	.447	10.351	.000	1.000	1.000
R= 0.472 R^2 = 0.223 Adjusted R^2 = 0.221 Std. error of the estimate =.95973 F change = 107.134					

Regarding attitude as a mediating construct, positive and statistically significant results were established with behavioural intentions (β = 0.447; *t* = 10.351; p<0.01). Furthermore, an examination of the correlation coefficients further revealed strong, positive and significant correlations between attitude and behavioural intentions (*r*=0.472). These results suggest that H_5 is supported and is, therefore, accepted in this study. These findings are supported in social media literature (Hsu and Lin, 2008; Hossain and De Silva, 2009).

Strengths, limitations and implications for future research

The findings of the study constitute an important source of knowledge and information on the antecedents of social media and attitude as an intervening construct in the behavioural intention to adopt social media. However, the study has a limitation in that its results are restricted to only one province in South Africa. This implies that caution must be exercised when generalising the results to other geographical locations and also when deriving subsequent conclusions from this study. There remains a need to replicate this study in other provinces within South Africa.

The findings highlight the importance of integrating other latent variables in order to find linkages in the acceptance and usage of social media among South African consumers. More robust statistical tools such as structural equation modelling may be employed with a view to testing the validity of the dimensions identified in this study.

6. Conclusions

Four constructs were identified as the salient antecedents of social media acceptance among South African consumers, namely, perceived enjoyment of technology, perceived ease of use, perceived usefulness and perceived critical mass. However, the results of the study supported only three of the constructs (PET, PEOU and PCM) as having positive and statistically significant associations with attitude. H_2, H_3 and H_4 were therefore accepted in this study. Furthermore, strong, positive and statistically significant results were established between attitude and behavioural intentions to use social media technologies; hence H_5 was accepted in the study. The study contributes to both theory and practice by advancing a hybrid model to examine social media antecedents, attitude and behavioural intentions to use the technologies, providing further building blocks in the study of technology adoption.

Businesses are challenged to incorporate enjoyment, ease of use and consideration for the existence of a critical mass when developing usability of social media platforms. More succinctly, social media has been delineated as 'the quiet marketing engine' of modern businesses. Albeit, the use of social media is growing at an astronomical rate among various emerging economies, among which South Africa is a part. Therefore, social media is expected to go a long way in enabling marketers to keep abreast of advances in marketing technology and further deliver product offerings on platforms that are acceptable to the masses. Moreover, this research presented the opportunity to study the underlying variables that are fundamental towards the acceptance of social media as a relevant tool for a plethora of marketing applications. The findings, therefore, help us better understand the assortment of social media antecedents that are an indispensable constituent when developing an extended promotional strategy that is based on virtual platforms; particularly, social media. In technology acceptance and adoption research, this study provided valuable insight into the acceptance and usage of new web 2.0 based technologies in a developing country context.

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Book review

MUTANOV Galym, Mathematical methods and models in economics, Almaty: Al-Farabi Kazakh National University, 2011, 448 pp, ISBN 978-601-247-254-7.

The book is concerned with mathematical methods and models applied to economics in order to support the decision making process at managerial and investment level. Among the methods and models presented, the author deals with those used in budget management, in currency exchange operations and assessment of innovation projects. The book presents the application of thermodynamic approach to control the economic systems, and shows how to apply the investment decision models in different conditions (certainty, uncertainty and risk).

The material is organized in 9 chapters (each of them followed by references), conclusions and a short presentation of the author.

The first and second chapter, *Mathematical methods of budget modeling* and *Methods and mathematical models of budget management*, presents a mathematical budget model based on the matrix of interaction of income and expenditure items. The entries of the matrix are computed as the ratio between the expenditures vector elements and the income vector elements. The differential of the budget equation gives the budget sensitivity to the controllable parameters. Statistical processing of the experimental data confirms that the model describes well the budget performance. The model can be used in an arbitrary section of budget classification and in any discrete period. The author also presents the problem of budget mechanism control, and then models for correcting program control and assessing program decisions, the dynamic model controlling flows of budgetary funds and the information system controlling financial budget flows.

The third chapter, *Energy-entropic methods in assessment and control of economic systems*, presents the arguments in favor of application of the thermodynamic approach to economic systems. The author explains how entropic estimation of the state of production system parameters allows us to estimate changes in parameters by a single relative indicator and to synthesize such estimations into a unified economic image of the current production situation. In real world, at a certain moment, each value of the state of a controlled object corresponds to a certain value of entropy; based on mathematical statements, it is proved how this approach is applicable for assessment of production systems.

The *Currency trading methods and mathematical models* are considered in the fourth chapter. In the first part, the currency market research and management is detailed, then some mathematical models of equilibrium exchanges rates. Further on,

the author presents some mathematical projection models for currency transactions, including the methodology of econometric modeling, the forecast problem of risk minimization, the spectral analysis of exchange fluctuations, and the collocation models (which can be used to solve tasks of exchange market forecasting). In the last part of the chapter, an information system for supporting decision-making is presented, in order to facilitate the adjustment of exchange rates.

The fifth chapter deals with *Methods and mathematical models of innovation project appraisal*. First, existing methods of project assessment are analyzed. Then, criteria and methods for assessing innovativeness and competitiveness, methods and models for assessing feasibility and cost-effectiveness of innovative projects, an information system of innovation project examination are developed.

Mathematical methods for making investment decisions are presented in the sixth chapter of the book. Among these we can find: methods used to assign the utility function values, search for the best Pareto point, convolutions of estimation criteria, criteria used to choose optimal solution, choosing a group solution on the basis of multicriterion estimation, hierarchy-analysis method as a synthesis of quantitatively measurable expert information, assessment of investment project by complex criteria, probabilistic approach to quantitative risk assessment, quantitative risk analysis based on the methods of fuzzy mathematics. In the last part of this chapter some examples of investment decision-making are explained.

In the seventh chapter, entitled *Multi-objective stochastic models for making decisions on resource allocation*, three new models of resource allocation have been developed, based on the combined target functional constructed in accordance with classical choice principles, such as egalitarianism and utilitarianism.

In chapter eight, *mathematical methods and models for monitoring of government programs* are presented. Here, the author presents the government program (GP) as a targeted system with program management, GP in terms of systems theory and general management theory, information and model representing of GP and methods of monitoring their implementation, methods and models for evaluation of GP implementation.

The first part of chapter nine, a cluster analysis of various regions of Kazakhstan is presented and then the chapter deals with *the methodology of identification of competitive industrial clusters*.

As we have mentioned before, each chapter ended with a comprehensive bibliography, the entire number of cited books or articles reaching 240.

The book is self-content and is a good material for a large number of academics and practitioners. It can be considered as an important title among the monographs concerned with mathematical methods and models in economics.

Diana-Andrada Filip