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ELECTRONIC SERVICE QUALITY AND ITS IMPACT ON BUILDING BRAND LOYALTY IN THE APPAREL E-RETAILING INDUSTRY

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ABSTRACT

Online service quality is of high importance to the overall user experience within e-commerce platforms. The website service quality is considered to be a good predictor of customers' brand loyalty intents. In this study four attributes of the electronic retailing service quality [website design, reliability/fulfillment, security/privacy and customer service] are studied based on the implications each one of them has towards brand loyalty [being measured through intentions to repurchase from the same brand on upcoming occasions and customer incentives to pay a price premium for the brand]. The paper aims to study this process in two contexts, when respondents are faced with a local vs global brand. The data collection is conducted through two focus groups. Considering that the study aims to measure perceptions, and knowing that the best way to express them is through linguistic terms, which is the way humans express their feelings on daily basis, the analysis is based on fuzzy logic. The analysis suggests that when customers are faced with global brands, service quality elements such as website design, customer service and reliability/fulfillment are good predictors for the creation of behavioral intents towards the brand. Whereas when customers faced with local brands, service quality elements such as security/privacy, reliability/fulfillment and website design, have high implications towards customers' behavioral intents.

Keywords:

Brand loyalty, online service quality, local vs global, fuzzy-set

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1. INTRODUCTION

During the last 15 years, there has been immense growth on the apparel industry providers offering products online. This segment of the market has seen high growth and is still considered on having potential to grow more. With the existence of global providers there have been as well local providers offering such services. This has mainly been as a consequence of better understanding local fashion trends; feature that has caused retailers to be more efficient with their stock. Offering good service quality appears to be essential for success in the online environment. From the organizations perspective, the relevance of these issues, mostly regards to how the service quality attributes impact behavioral intents that customers develop throughout their experiences online. The importance of the online service quality on the cases when customers buy from local or global brands formalizes the ground for the objectives that this research aims to study:

- Identify key service quality attributes that impact upcoming repurchasing behavioral intents;
- Identify key service quality attributes that incentivize customers to pay a price premium;
- Assess the relationships between the service quality attributes and behavioral intents in situations where customers are purchasing from local versus global brands.

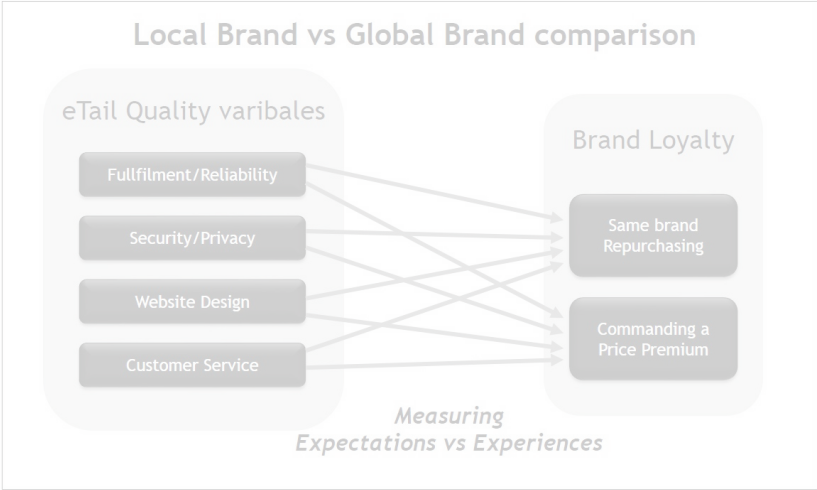
A plausible answer to these questions is beneficial in contributing to the current academic discussion in the area; as well as to assisting practitioners operating in this field, taking into account that this relationship directly affects their profitability on the long run.

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2. CONCEPTUAL FRAMEWORK

In order to answer the questions this study poses, we proceed with presenting previously conducted research on the constructs of the study, being brand awareness, brand loyalty and e-commerce service quality attributes.

Figure 1.: The Conceptual Model



Brand Awareness [local versus global brands] and brand loyalty and the e-commerce

In a transaction there are always risks that are encountered between the buyer and the seller, where brands are found to have a high importance benefit as risk reducers (Roselius, 1971). Based on research conducted by Keller (2012), brands are regarded to reduce risk perceptions in a buying decision. According to Pan et al (2012), customers perceive the online environment to be riskier due to the non-physic exchange of purchases. Consequently, in the online, they base their buying decision on brands that they know, hence the role of known brands locally or known brands at a global level. The role of local versus global brand offering similarities, would be seen as different primers affecting customers. The self-identification or being part of one's community could be seen as main elements empowering local brands. Previous research has proved that in developed countries consumers prefer brands with strong local connections (Zhang and Khare, 2009). Whereas, this relationship has been questionable in developing countries, considering their aspiration for further towards developed countries culture and life style (Chiu, 2015). Global brands are considered brands that market to several countries across the world. Strong associations that are leveraged by global brands are: good perceived quality, level of prestige and psychological benefits (EM Steenkamp, Batra, and Alden, 2003).

Based on these determinants related to brand awareness and the benefits of local vs global brands, we assume brand awareness and country of origin to play a crucial role in the perceptions towards service quality attributes that this research aims to study. According to Oliver (1999), loyalty is described as the "commitment to rebuy or re-patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts, having the potential to cause switching behavior". Through this

definition of loyalty, the main emphasis is put in the re-purchasing of the same-brand or brand-set regardless of the risks from external factors influencing the switching behavior to another brand. With regards to the online world, research has shown that an increase of 5% in customer retention, consequentially affects profit growth from 25% to 90% within the fifth year (Schefter and Reichheld, 2000). This essential growth on customer retention is associated to a better service offered online which affects customers' behavioral intents to revisit the website. In this study, elements of importance are related to the behavioral loyalty, that Keller (2012) defines in terms of repeated purchases, and attitudinal attachment. Acquiring customers via the web is costly and, since the competition is just a mouse click away, customer e-loyalty appears essential in an economic as well as a competitive sense (Gustafsson et al., 2005). Thus, e-loyalty is defined as the "consumer's favorable attitude toward the e-retailer that results in repeat buying behavior" (Srinivasan, Anderson, and Ponnnavolu, 2002). Service quality level is confirmed to affect the behavioral intents that customers tend to develop with the brand (Zeithaml, Berry, and Parasuraman, 1996). Brand loyalty has been proved to be affected by the level of brand awareness but this process is considered to be mediated by the impact that perceived quality that customers expect to receive from a global vs local brand (Roy and Chau, 2011). Offering customers a good service quality online is believed to be a good predictor towards pushing customers to repurchase from the same brand and incentivize them into paying a price premium for the services.

Electronic commerce is defined as 'all electronically mediated information exchange between an organization and its external stakeholders' (Chaffey, 2007). According to Bakos (1998), the reasons behind e-commerce's success lie upon its successful leverage of information technology to offer a platform where there is an increased effectiveness and decreased transaction costs, consequently leading to an increase in efficiency. According to Tassabehji and Ebrary (2003), customer's benefits that accrue when using e-commerce are: 24/7 access, ease of switching from one supplier to another through a live price comparison between the offerings and a wider variety of products being offered. In this study, the main focus would be on the comparison between two similar e-commerce platforms. ASOS is an international apparel fashion retailer founded in 1999, with coverage across Europe, Asia and USA (ASOS 2015); and on the other hand OXYS founded in 2012, which is an fashion electronic retailer and offers its products and services within Albania and Kosovo. These two were taken as an example considering the high awareness they enjoy across Tirana, Albania. One of the main characteristics they share across each other, are that they sell goods through e-commerce platforms. The impact of how one customer may judge the service quality variables and how he/she might become brand loyal towards the brand, is considered to be mediated by the brand awareness and associations that the brand offers.

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2.1. Measuring Electronic Service Quality [eTail Quality]

Positioning the consumer as the focal point of the study and offering a good service quality online is a key determinant in fostering web sales and profits for the company. In addition to the quality of goods or services offered, other determinants in being successful are the website presence and a low price of goods or services offered. Studies on the online environment and the service quality offered in e-commerce platforms have been researched from different perspectives: satisfaction with the website (Alpar, 1999; Blut et al, 2015) website success (Liu and Arnett, 2000); intention to purchase and the intention to revisit (Loiacono, Watson, and Goodhue, 2007); online experience (Novak, Hoffman, and Yung, 2000) and customer loyalty (Srinivasan, Anderson, and Ponnnavolu, 2002). All these studies pinpoint attributes of the service quality online, but lack the general sense of the service quality measurement, from a pre-purchase, purchase to post-purchase review of the process. An overall evaluation of the service quality online has been proposed by Wolfinbarger and Gilly (2003), called electronic retailing service quality [eTail Quality], which focuses into measuring the service quality in an e-commerce platform holistically at all stages of the customer interaction with the website. Depicting the whole process on purchasing goods online from the information search, service provided through the navigation on the website, the process of ordering the goods, potential customer service correspondence between the seller and buyer, finalized by the procedure of shipping the product to the buyer. Dimensions measuring the eTail quality are: fulfillment/reliability, website design, customer service and security/privacy. According to Parasuraman and Berry (1985), service quality measures the gap between what consumers expect from the service and what their perceptions after experiencing the service are. The gap between the two measures presents the perceived service quality. Therefore perceived quality signifies an overall attitude/judgment towards the service quality for its superiority compared to competitors (Zeithaml, 1988). According to Chien and Tsai (2000), from a customer's stand point expectations and perceptions characterize the difference between the importance degree related to the expected quality and the satisfaction degree corresponding from the perceived experience. Seemingly the importance and significance of a good service quality offered in offline or online, appears to have a huge implication of the company's success.

Fulfillment/reliability as defined by Wolfinbarger and Gilly (2003) is "[a] the accurate display and description of a product so that what customers receive is what they thought they ordered, and [b] delivery of the right product within the time frame promised." So, fulfillment and reliability is a consequence of a couple of implications such as the representation of the adequate product which is shown on the website and what is going to be delivered; technology which is used in the e-commerce framework and its functionality of receiving orders correctly and forwarding these

orders in time; and finally the relationship between the online retailer and the delivery services in order that the consumer receives the products that are purchased at a certain time within the deadline that was stated in the website.

Website design includes all elements relevant to the customer's experience with the website [except for customer service]. It includes dimensions as navigation, information search, order processing, appropriate personalization and product selection. According to Schaffer (2000), it is the inability to navigate a website and failure to find their way through, which represents 30% of customers who leave the website without purchasing anything. According to Pastrick (1997), elements such as fast loading, uncluttered and easy to navigate websites characterize the best dimensions for a satisfying e-commerce experience. Because, e-commerce platforms that are characterized with these elements offer the benefit for consumers to shorten their shopping time compared to the offline world. In order to characterize website design these were the guidelines: Very user friendly navigation; Huge caching ability, speed optimized website, allowing a very quick navigation within the website; Once creating a user and sharing your preferred styles, the website automatically suggests goods that you might be interested in purchasing; A one-click option to purchase a product (Rosen and Purinton, 2004; Sharma and Lijuan, 2015).

Customer service refers to the care that the online retailer has shown towards situations where customers face challenges with the framework. According to Wolfinbarger and Gilly (2003), employees' skills or technological tools that offer prompt solutions to customers facing these challenges play a crucial role at this point. Thinking of customer service is regarded as the process of not allowing any problem occurrence within the system; however if challenges are faced, the efficiency and effectiveness to solve these issues is measured. With the social media framework people can easily share bad reviews to the users of people within social media. Therefore, the impact that customer service has on the whole experience and behavioral consequences towards brand loyalty is considered of immense importance. Customer service is defined in this study by Wolfinbarger and Gilly (2003) as the "responsive, helpful, willing service that responds to customer inquiries quickly."

To measure the customer service offered online these characteristics are used: The option of contact us for any issue that you face with the framework or shipping issues is available; A phone line is given, offering assistance for any questions that the consumer might have; An immediate chat option is offered, so that customers get an immediate response regarding the challenges that they are facing.

Security/privacy is related to the level of credit card payments security and privacy of users shared information. Even though privacy and security are used as an expression together, they tackle different elements within the experience online. Privacy is related to the safety level of how information is gathered from customers, how the data are stored and finally for what purposes the data will be used. Another point to make with regards to privacy is that of asking from the visitor of the platform on

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approving the data usage conditions (Friedman, Khan Jr, and Howe, 2000). Whereas security is related to the financial risks that consumers might face throughout their online transactions. Such as how the credit card information will be handled and the protection level of conserving that information from vulnerable acts (Wolfinbarger and Gilly, 2003). According to Hoffman, Novak, and Peralta (1999) information privacy is listed as the top concern for web visitors. Based on his study, people that do not buy online appear not to be taking this decision based on functional reasons but it is mostly with regards to the frightening fact of giving personal information away. Miyazaki and Fernandez (2001), consider that privacy and security issues represent the crucial barriers for the consumers not using e-commerce activities. Moreover, potential online customers are very aware of the implications of privacy and security in an environment which contains potential threats for vulnerability acts (Culnan and Armstrong, 1999).

With regards to characterizing the Security and Privacy these elements are used: Personal information is gathered only when information is given by the consumer [such as when you open your account] and through cookies, in order to have better results on the recommended products or offering the 1-click purchase option; We only share personal information related to specific transaction when the product needs to pass through one of our affiliated parties. The information shared is strictly connected only to information concerning that transaction; With regards to the security, information given from the customers' side is encrypted with advanced software named Secure Sockets Layer [SSL], offering a high level security; Only the information of the credit card can be seen when a customer wants to buy a product, in order to decrease the probability of vulnerability acts by third parties; And finally, all the security and privacy terms and conditions are during the whole time accessible through the website.

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3. RESEARCH METHODOLOGY

The main focus of this study is on measuring the service quality offered in e-commerce platforms and the implications it has on behavioral intents to repurchase from the brand and pay a price premium for it based on the case of dealing with local or global brands. The relation between the two is studied under two conditions, being the importance degree and the satisfaction degree (Chien and Tsai, 2000). In order to measure the possible implications of local vs global brand we apply the same research in two focus groups, where [i] one analyzes the implications when consumers purchase from a local brand, OXYS is taken as an example in this case and [ii] analyzes the implications when participants purchase from a global brand, ASOS will be used as the brand to study. Rihoux and Ragin (2009), discussed the need to set up sufficiently comparative cases which share similar patterns is essential for a research aiming on drawing parallels of comparison between them. In order to have a simi-

lar pool of participants in the experiment, the case selection procedure covered two phases:

First phase: A homogenous pool of participants was demanded with regards to experiences online. During this phase 70 people were contacted, in order to be presented with the research, and whether they showed interest in being part of this study. In order to be eligible as a participant in the study a person should have fulfilled the below mentioned criteria:

- Every participant needed to have at least purchased online three times during the last year;
- Every participant should be familiar with both OXYS and ASOS brand;
- Every participant needed to have spent at least 50 Euros on their online purchases throughout 2015;
- Every participant needed to have previous experience on buying apparel goods online.

From the total number of 70 cases that were contacted in Tirana [Albania], demanding a reply from the ones that fulfilled the above mentioned criteria, 19 replied to the email, admitting their interest in the study. A certain date was set when and where the experiment would take place. Furthermore, only 14 were available on that specific date and time.

Second phase: The 14 participants were assigned randomly into the two groups. A bowl of mixed papers having written a unique number in them varying from 1 to 14 was used. The participants were asked to get a paper from the bowl and tell the number.

The participants having numbers from 1 to 7 were assigned to Group 1 [OXYS group] and the participants having numbers from 8-14 were assigned to Group 2 [ASOS group].

Conducting experiments seems to be the best way of finding the cause-effect relations between study constructs (Christensen, Johnson, and Turner, 2009). The study controls for internal validity by setting out a strict guideline for participants in order to be part of the research, which is elaborated below. During the experiment the participants are randomly assigned to the focus groups. Having on focus the measurement of linguistic terms such as importance degree and satisfaction degree, the challenge was on selecting the appropriate method of analysis. Customer perceptions are expressed in linguistic terms and expecting respondents to provide objective response in continuous data is a bit a challenge (Chien and Tsai, 2000). On the other hand, fuzzy logic and fuzzy sets have appeared to be very significant methods on using linguistic terms as inputs for approximate reasoning (Zimmermann, 2001). As well they have proved to be very effective in situations of uncertainty such as is the case when customer perceptions are studied (Zadeh, 2002). The strong point of fuzzy logic and fuzzy sets lies upon the fact of offering a linguistic degree of vagueness as a metric which in real life situations is a common case (Bojadziev and Bojadziev, 2007). Measuring customer perceptions based on fuzzy logic seems to be more objective for this particular study, thus we decide to proceed by utilizing this method.

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4. THE FUZZY SETS THEORY AND FUZZY ARITHMETIC

As a theory, it has had a wide application on research fields as: computer science, decision theory, logic, management science, operations research as well as pattern recognition (Bojadziev and Bojadziev, 2007). Conventional or crisp sets are seen as the primates of fuzzy sets. Zimmermann (2001), referred to crisp sets as "*a collection of elements or objects that can be finite countable, or over countable*". The pioneer in fuzzy logic and fuzzy sets, Lotfi Zadeh (Jacoby and Kyner, 1973) referred to this traditional logic as when "*the complexity of a system increases, our ability to make precise and yet significant statements about its behavior diminishes until a threshold is reached beyond which precision and significance [or relevance] become almost mutually exclusive characteristics.*"

In real life, this is rarely the case, considering that mostly an attribute can be considered as member for a certain amount to a certain group and as well there could be a possibility of being member to another group. The downfall of the crisp set theory and bivalent logic that probability theories use are that, in real life, variables might be partly members of a set or outcome (Rihoux and Ragin, 2009). The theory of fuzzy sets allows partial membership to a given condition between a full nonmember denoted by 0 and a full member denoted by 1; in order to describe the gradual transitions between the two continuums. As a theory it consists of this strong point that based on the analysis, it allows an attribute or condition to be a partial member of the outcome (Zimmermann, 2001). For ex. if A is the set of importance degree between the eTail Quality attributes and brand loyalty types, fuzzy set represents the set of ordered pairs where is the membership function of x in A. This membership function can vary in between the two continuums of being nonmember to being a full member of the outcome that is studied (Zadeh, 1965).

In this study the two conditions importance degree and satisfaction degree could be considered as vague or with a degree of vagueness and hardly conceptualized (Chien and Tsai 2000). The condition of importance degree between eTail Quality attributes and brand loyalty types; through fuzzy sets we can offer the glimpse on understanding the partial membership that the attribute might have on the outcome. The same holds for the satisfaction degree which is analyzed in this study.

There are two major reasons why this theory applies in discovering the puzzle in this work. This range is given in linguistic terms in order not to lose its objectivity, when data is collected. The benefit of fuzzy sets is that it enjoys the possibility on using the same arithmetic calculations as conventional sets such as union, intersection and negation (Rihoux and Ragin, 2009), which provide a good background on finding cause-effect relations and pattern recognition in the variables that are studied. Another reason for using this method on this study would be the lack of having a defined parameter on measuring importance degree and satisfaction degree (Chien and Tsai, 2000). Linguistic terms as importance and satisfaction are not determinis-

tic compared to a linguistic term as height, which can be measured based on a certain set of scales such as meter, feet etc. The fuzziness on defining the concepts makes the conditions that are being studied to be adequate for a fuzzy sets study.

The bases of fuzzy arithmetic imply that, let the universe of discourse X be the subset of real number R where $X = \{x_1, x_2, x_3, \dots, x_n\}$. A fuzzy set $A = \{(x, \mu_A(x)) \mid x \in X\}$ in X is a set of ordered pairs where $\mu_A(x)$ is called the membership function where

$$\mu_A(x) : X \rightarrow [0,1]$$

Through the various types of fuzzy number representations, this study uses the triangular fuzzy numbers which are proved to have wide applications in social sciences (Bojadziev and Bojadziev 2007). The membership degree of importance and satisfaction conditions, in terms of triangular fuzzy number Fig. 1, lays between a_1 , meaning full nonmember of a set; a_2 denoting a full member of the set and a_3 denoting full nonmember of the set. The triangular fuzzy numbers are denoted by $\tilde{A} = (a_1, a_2, a_3)$. The v_A score in Fig. 1, is the point that divides the bounded area of a triangular fuzzy number $\tilde{A}$ into two equal parts.

Figure 2.: A triangular fuzzy number



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Using the same method as used by Chien and Tsai (2000), which applies based on previous findings from Dubois and Prade (1985), Peter, Churchill Jr, and Brown (1993), Klir and Yuan (1995) we proceed on understanding the study and analyzing the data through four stages, being:

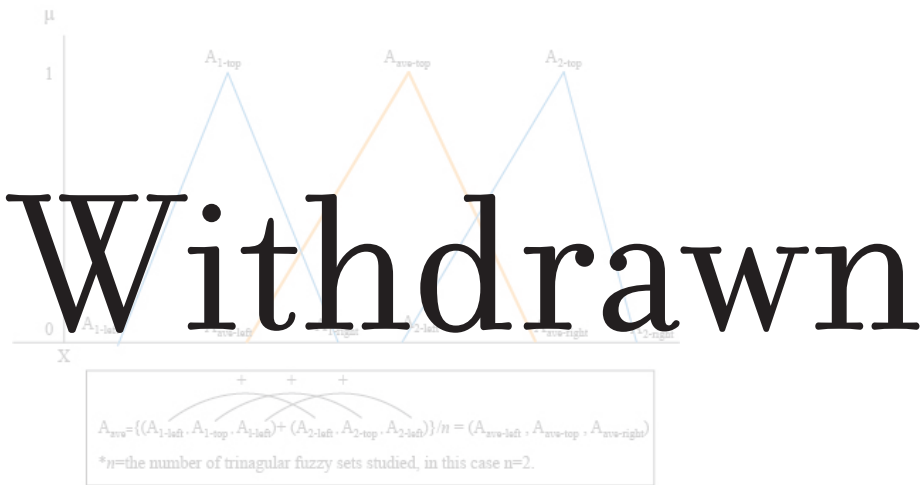
- (1) Firstly, since importance degree and satisfaction degree could be considered as vague terms of measurement Chien and Tsai (2000), in this study we fuzzify these two degrees, which are shown as m_A [for the importance degree] and m_B [for the satisfaction degree]. These two membership scores correspond to Group 1 respondents. The same procedure is applied to Group 2 and create membership scores presented by m_C for importance degree and m_D for the satisfaction degree. The process of fuzzifying the importance degree and satisfaction degree is shown in Eq. [1]. The same procedure is applicable for m_B , m_C , and m_D .

$$m_A(x) = \begin{cases} y_a^L(x) = \frac{x - a_1}{a_2 - a_1}, & a_1 \leq x \leq a_2 \\ y_a^R(x) = \frac{x - a_3}{a_2 - a_3}, & a_2 \leq x \leq a_3 \\ 0, & \text{otherwise.} \end{cases} \quad [1]$$

- (2) In order to understand the general descriptive part within the surveyed groups we use the average fuzzy number denoted by $\tilde{A}_{ave}$ for the n triangular numbers, Eq [2]. The same is done to membership scores for B, C and D sets. Graphical presentation of the procedure is shown in Fig. 2.

$$\tilde{A} = \tilde{A}_{ave} = \frac{\tilde{A}_1 + \tilde{A}_2 + \dots + \tilde{A}_n}{n} = \left(\frac{\sum_{i=1}^n a_1^{(i)}, \sum_{i=1}^n a_2^{(i)}, \sum_{i=1}^n a_3^{(i)}}{n} \right) = (a_1, a_2, a_3) \quad [2]$$

Figure 3.: Fuzzy Averaging



- (3) Clarify weak and/or conditions for each eTail quality attribute with regards to the two types of brand loyalty Eq. [3]; Eq. [4]; Eq [5]. Furthermore, understanding the implications that local brands vs global brand has on positioning a specific attribute as sufficient for the outcome to happen.

$$v_A = (a_1 + 2a_2 + a_3) / 4 \quad [3]$$

$$v_B = (b_1 + 2b_2 + b_3) / 4 \quad [4]$$

$$v = v_B \leq v_A \quad [5]$$

Through this analysis we are after to find whether the importance or satisfaction degrees are greater or smaller when compared to one another. Using the theory from Chien and Tsai (2000), In the findings section we will present which eTail Quality attribute appears to be sufficient for behavioral intentions to happen.

(4) Defuzzifying sets which are of interest to the study.

As the last step of the process we use the v scores Eq. [3] and Eq. [4], to defuzzify the sets, and give them the approximate linguistic term. This type of defuzzification procedure has been proved to work very well in studies where triangular fuzzy numbers are used (Zimmermann 2001, Chien and Tsai, 2000, Bojadziev and Bojadziev, 2007), which is the case in this study.

5. ANALYSIS

This section will firstly give the descriptive information on the samples being: gender and value of online purchases during 2015 for the focus group participants. Then, the analysis deepens into interpreting linguistic terms into fuzzy sets, aggregation of group opinions and finally the mathematical analysis to see the differences between the trends in the samples and lastly generalize from the sample.

In terms of group composition, the Group 1 [OXYS] consisted of three males and four females, whereas Group 2 [ASOS] consisted of two males and five females. In terms of the value of online purchases throughout 2015, in Group1, one [or 14% of all cases] reported spending 500€ to 1000€ during 2015, and six [or 86% of all cases] reported spending more than 1000€ during 2015. In Group 2, two [or 29% of all cases] reported spending between 500€ to 1000€ during 2015, and five [or 71% of all cases] proclaimed spending more than 1000€. Overall in the two groups, a percentage, 21% spent between 500€ to 1000€ during 2015; whereas 79% spent more than 1000 euro during the same year.

In order to analyze the linguistic results extracted during the focus groups, the linguistic terms are converted into fuzzy sets. Let the triangular fuzzy number that signifies the i^{th} consumer's linguistic importance degree of eTail quality attributes having as an outcome the two brand loyalty types and be one that is the i^{th} consumer's linguistic satisfaction degree of eTail quality attributes having as an outcome the two brand loyalty types. k denotes the k^{th} eTail quality attribute; j represents the j^{th} type of brand loyalty. In terms of sets the $i=1,2,3,\dots,n$; representing consumer's linguistic term, where n is the number of cases that were analyzed, $k=1,2,3,\dots,p$; where p denotes the number of eTail quality attributes and $j=1,2,3,\dots,m$; where m denotes the number of brand loyalty types. In this case in hand, since there are two groups consisting each of 7 participants, each group consists of these numbers: $i=7$, $k=4$ and $j=2$; so we have seven cases, four different eTail quality attributes and two types of brand loyalty.

The same numbers of $i=7$, $k=4$ and $j=2$; are relevant for $\tilde{A}_i^k$ and $\tilde{B}_i^k$ triangular fuzzy numbers. They characterize the findings for the importance degree and satisfaction degree, correspondingly, from Group 1, which is the OXYS group. The same is conducted as well for the Group 2 [ASOS], represented by $\tilde{C}_i^k$ importance degree and $\tilde{D}_i^k$ satisfaction degree of eTail quality attributes having as an outcome brand loyalty types. In all cases k and j are constants [meaning $k=4$, and $j=2$], we simplify the mathematical symbols and substitute $\tilde{A}_i^k$ to $\tilde{A}_i$, $\tilde{B}_i^k$ to $\tilde{B}_i$, $\tilde{C}_i^k$ to $\tilde{C}_i$ and $\tilde{D}_i^k$ to $\tilde{D}_i$.

For the fuzzification procedure the raw information gathered from the focus groups is needed and linguistic terms are converted into fuzzy sets: $\tilde{A}_i = (a_1, a_2, a_3)$; $\tilde{B}_i = (b_1, b_2, b_3)$; $\tilde{C}_i = (c_1, c_2, c_3)$; $\tilde{D}_i = (d_1, d_2, d_3)$. Using the fuzzy importance degree is presented as the membership scores, being: very unimportant [0,0,2], unimportant [0,2,4], fair [2,4,6], important [4,6,8] and very important [6,8,8]. The coordinates next to the linguistic term represent the triangular fuzzy numbers of the importance degree.

Figure 4.: The consumer's linguistic term of Importance in fuzzy set



The satisfaction degree in linguistic terms has been proposed from Chien and Tsai (2000), presented in Fig [4], the scales are: very unsatisfactory [0,0,2], unsatisfactory [0,2,4], fair [2,4,6], satisfactory [4,6,8] and very satisfactory [6,8,8]; representing the cases in Group 1 and Group 2.

Figure 5.: The consumer's linguistic term of Satisfaction in fuzzy sets



The transformation of linguistic terms from the raw data table to triangular fuzzy numbers was done through was used for $\tilde{B}$, $\tilde{C}$, and $\tilde{D}$. These equations set the membership score to understand the left [L] and right [R] of the membership function. There is a rule about the triangular fuzzy numbers that $a_1 < a_2 < a_3$, a rule which is valid as across all membership sets.

5.1. Aggregating group opinions

In order to reason from the group opinions, the study focuses on using theoretical frameworks, in order to aggregate group opinions for each condition related to the eTail quality attributes and the two brand loyalty types: the latter considered as the outcome of the study. The aggregation of group opinions is conducted through Eq. [6], Eq [7], Eq [8], Eq [9] (Bojadziev and Bojadziev 2007), for each condition: for Group 1 importance degree denoted by $\tilde{A}$ and satisfaction degree denoted by $\tilde{B}$. The same rule is applied as well for Group 2, importance degree denoted by $\tilde{C}$ and satisfaction degree denoted by $\tilde{D}$. The graphical representation of the theory behind aggregating group opinions can be found at Fig. 2.

$$\tilde{A} = A_{ave} = \frac{\tilde{A}_1 + \tilde{A}_2 + \dots + \tilde{A}_n}{n} = \frac{(\left[\prod_{i=1}^n a_1^{(i)}, \prod_{i=1}^n a_2^{(i)}, \prod_{i=1}^n a_3^{(i)} \right])}{n} = (a_1, a_2, a_3) \text{ Eq. [6]}$$

$$\tilde{B} = B_{ave} = \frac{\tilde{B}_1 + \tilde{B}_2 + \dots + \tilde{B}_n}{n} = \frac{(\left[\prod_{i=1}^n b_1^{(i)}, \prod_{i=1}^n b_2^{(i)}, \prod_{i=1}^n b_3^{(i)} \right])}{n} = (b_1, b_2, b_3) \text{ Eq. [7]}$$

$$\tilde{C} = C_{ave} = \frac{\tilde{C}_1 + \tilde{C}_2 + \dots + \tilde{C}_n}{n} = \frac{(\left[\prod_{i=1}^n c_1^{(i)}, \prod_{i=1}^n c_2^{(i)}, \prod_{i=1}^n c_3^{(i)} \right])}{n} = (c_1, c_2, c_3) \text{ Eq. [8]}$$

$$\tilde{D} = D_{ave} = \frac{\tilde{D}_1 + \tilde{D}_2 + \dots + \tilde{D}_n}{n} = \frac{(\left[\prod_{i=1}^n d_1^{(i)}, \prod_{i=1}^n d_2^{(i)}, \prod_{i=1}^n d_3^{(i)} \right])}{n} = (d_1, d_2, d_3) \text{ Eq. [9]}$$

After running the analysis, the results for the condition "importance degree" in Group 1 A_{ave} ; in Group 2 C_{ave} . With regards to the satisfaction degree we have B_{ave} for Group 1; and D_{ave} for Group 2.

5.2. Strong or weak eTail Quality attributes

In order to understand which eTail Quality attribute is sufficient for the outcome to happen; meaning the behavioral intents, the measurement through strong or weak attribute analysis is used. Considering that these study measurements are based on the importance and satisfaction degree, it is considered that satisfaction degree to be the outcome that signifies the relation between eTail attributes and brand loyalty types to happen. So, if the satisfaction degree for a given eTail Quality attribute is

greater than the importance degree of the same attribute, we say that the attribute is strong related to the specific brand loyalty type; and the opposite.

To find out the strong or weak attribute the procedure of comparing the group opinions is used (Chen 1996). The average triangular fuzzy numbers $\tilde{A} = (a_1, a_2, a_3)$ and $\tilde{B} = (b_1, b_2, b_3)$ for the importance and satisfaction degree, individually, corresponding to Group 1 responses; and $\tilde{C} = (c_1, c_2, c_3)$ and $\tilde{D} = (d_1, d_2, d_3)$ for the importance and satisfaction degree, individually, corresponding to Group 2 responses. These averages are applied to Eq [10], Eq [11].

$$v_A = (a_1 + 2a_2 + a_3) / 4 \quad \text{Eq. [10]}$$

$$v_B = (b_1 + 2b_2 + b_3) / 4 \quad \text{Eq. [11]}$$

$$v_{Group1} = v_B - v_A \quad \text{Eq. [12]}$$

Eq [12], measures the difference in importance degree and satisfaction degree for each eTail Quality attribute affecting brand loyalty types, accordingly, within Group1. The same procedure is followed for Group2 responses.

For the two groups, we get the difference scores between the importance degree and satisfaction degree symbolized as V_{Group1} and V_{Group2} , for every single eTail quality attribute related to the types of brand loyalty.

- Rule1: If $v > 0$; the satisfaction degree is greater than the importance degree, we say the eTail quality attribute is considered strong for the specific outcome to happen.
- Rule2: If $v < 0$ then the satisfaction degree is smaller than the importance degree. Once we get a score as that, we consider the attribute weak for the outcome to happen.
- Rule3: If $v = 0$, means that the attribute has been considered at the same level of importance and satisfaction for the outcome. In this study we have no such results.

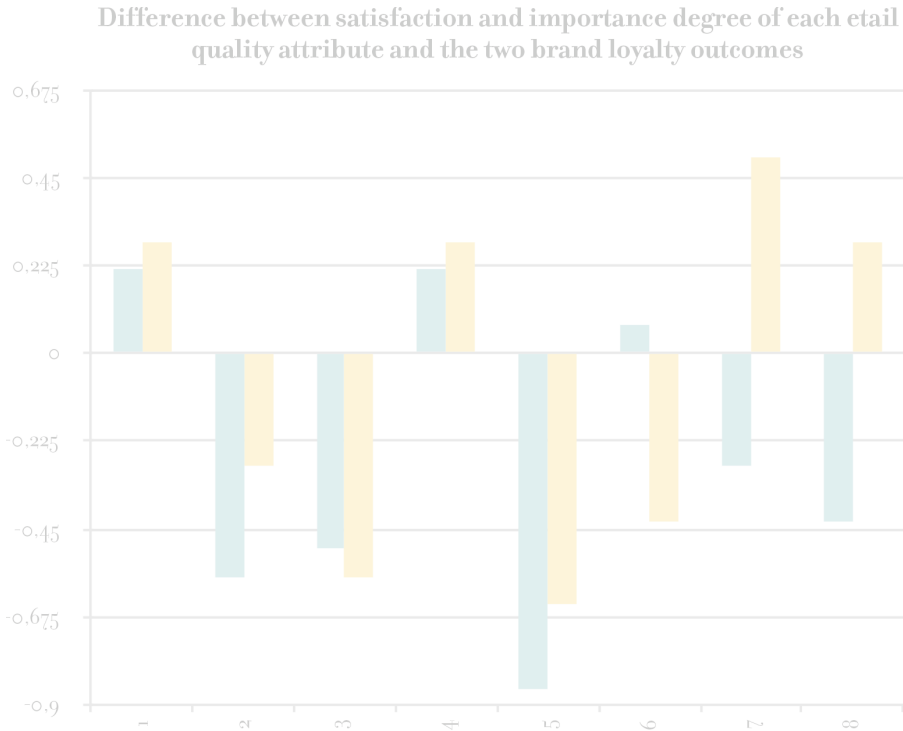
Table 1: Strong or Weak eTail quality attributes for the outcome

	$vscore_A = (a_1 + 2^*a_2 + a_3) / 4$	$vscore_B = (b_1 + 2^*b_2 + b_3) / 4$	$vscore_{Group1} = vB - vA$	$vscore_C = (c_1 + 2^*c_2 + c_3) / 4$	$vscore_D = (d_1 + 2^*d_2 + d_3) / 4$	$vscore_{Group2} = vD - vC$
importance degree of website design for paying a price premium	$(3.1 + 5.1 + 7.1) / 4 = 5.14$		0.214	$(3.1 + 5.1 + 7.1) / 4 = 5.14$		0.286
satisfaction degree of website design to urge you into paying a price premium		$(3.4 + 5.4 + 7.1) / 4 = 5.35$			$(3.4 + 5.4 + 7.4) / 4 = 5.42$	
importance degree of website design in order to repurchase	$(3.4 + 5.4 + 7.4) / 4 = 5.42$		0.57	$(4.0 + 6.0 + 7.4) / 4 = 5.85$		-0.286
importance degree of website design to urge you into repurchasing		$(2.9 + 4.9 + 7.4) / 4 = 5.35$			$(3.7 + 5.7 + 7.4) / 4 = 5.64$	
importance degree of fulfillment/reliability for paying a price premium	$(4.6 + 6.6 + 7.7) / 4 = 6.35$		-0.5	$(4.3 + 6.3 + 8.0) / 4 = 6.21$		-0.571
satisfaction degree of fulfillment/reliability to urge you into paying a price premium		$(4.0 + 6.0 + 7.4) / 4 = 5.85$			$(3.7 + 5.7 + 7.4) / 4 = 5.64$	

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importance degree of fulfillment/reliability in order to repurchase	$(4.9+6.9+8.0)/4 = 6.64$		0.214	$(3.7+5.7+7.4)/4 = 5.64$		0.286
satisfaction degree of fulfillment/reliability to urge you into repurchasing		$(5.1+7.1+8.0)/4 = 6.85$			$(4.0+6.0+7.7)/4 = 5.92$	
importance degree of security/privacy for paying a price premium	$(4.6+6.6+8.0)/4 = 6.42$		-0.86	$(3.7+5.7+7.7)/4 = 5.71$		-0.643
satisfaction degree of security/privacy to urge you into paying a price premium		$(3.7+5.7+7.1)/4 = 5.57$			$(3.1+5.1+6.9)/4 = 5.07$	
importance degree of security/privacy in order to repurchase	$(4.0+6.0+7.4)/4 = 5.85$		0.071	$(4.6+6.6+7.7)/4 = 6.35$		-0.429
satisfaction degree of security/privacy to urge you into repurchasing		$(4.0+6.0+7.7)/4 = 5.92$			$(4.0+6.0+7.7)/4 = 5.92$	
importance degree of customer service for paying a price premium	$(3.1+5.1+7.1)/4 = 5.14$		-0.29	$(2.6+4.6+6.7)/4 = 4.62$		0.5
satisfaction degree of customer service to urge you into paying a price premium		$(2.9+4.9+6.9)/4 = 4.85$			$(3.1+5.1+6.9)/4 = 5.07$	
importance degree of customer service in order to repurchase	$(4.3+6.3+7.7)/4 = 6.14$		-0.43	$(4.0+6.0+7.4)/4 = 5.85$		0.286
satisfaction degree of customer service to urge you into repurchasing		$(3.7+5.7+7.7)/4 = 5.71$			$(4.3+6.3+7.7)/4 = 6.14$	

Figure 6.: Graphic for the Strong and weak eTail quality attributes for the outcome



In the Y-axis of the diagram, the difference between satisfaction degree and importance degree for every attribute connected to the outcomes is found; attributes are written in "1,2,3,...,8". Considering that the study comprises 4 factors eTail quality attributes and two brand loyalty outcomes, we have an overall representation of eight combinations, for each group that was studied.

5.3. Defuzzifying sets

During the defuzzification procedure we focus on the v scores that are greater than the value 0, because these scores have shown that the given attribute is sufficient for the outcome to happen. Considering that in both groups, we have found positive scores for the website design attribute towards paying a price premium and reliability/fulfillment for the outcome of repurchasing we present the average weighted scores in approximate linguistic terms.

Table 2.: Defuzzification scores

Defuzzifying membership scores into percentages of membership				
		vscores	Important	Fair
importance degree of website design for paying a price premium	OXYS Group 1	5.14286	57.14%	42.86%
		vscores	Satisfactory	Fair
satisfaction degree of website design to urge you into paying a price premium	OXYS Group 1	5.35714	67.86%	32.14%
		vscores	Importance	Fair
importance degree of website design for paying a price premium	ASOS Group 2	5.14286	57.14%	42.86%
		vscores	Satisfactory	Fair
satisfaction degree of website design to urge you into paying a price premium	ASOS Group 2	5.42857	71.43%	28.57%
		vscores	Important	Very Important
importance degree of fulfillment/reliability in order to repurchase	OXYS Group 1	4.4286	32.14%	67.86%
		vscores	Satisfactory	Very Satisfactory
satisfaction degree of fulfillment/reliability to urge you into repurchasing	OXYS Group 1	6.85714	42.86%	57.14%
		vscores	Important	Fair
importance degree of fulfillment/reliability in order to repurchase	ASOS Group 2	5.64286	82.14%	17.86%
		vscores	Satisfactory	Fair
satisfaction degree of fulfillment/reliability to urge you into repurchasing	ASOS Group 2	5.92857	96.43%	3.57%

Website design towards paying a price premium for the local and global brand.

In order to better understand the implications of this finding, the study defuzzifies the v scores by running a quick analysis on the distance between the two closest membership scores where the given v score has fallen. The values are represented in percentages. The formula used in this study, has been proved as a decent method in defuzzifying triangular fuzzy numbers in social sciences (Chien and Tsai, 2000, Bojadziev and Bojadziev, 2007).

Taking v_A , v_B , v_C and v_D scores as the weighted averages for the triangular fuzzy numbers representing the importance degree and satisfaction degree for each eTail quality attribute; The v_A and v_B scores are extracted in the relation between website design towards paying a price premium in Group 1, for the importance degree, the v_A score is 5.14286, corresponding to 57.14% into the membership score of being Important and 42.86% into being a member of the set Fair. Whereas for the satisfaction degree the v score is 5.35714 corresponding to 67.86% into being a member of the set Satisfactory and 32.14% in being a member of the set Fair.

This finding leads to understand that website design is sufficient for the outcome of paying a price premium for the local brand [OXYS] to happen. Since the satisfaction degree is greater than the importance degree.

In Group 2, for the importance degree, the v_C score is 5.14286, corresponding to 57.14% into the membership score of being Important and 42.86% into being a member of the set Fair. Whereas for the satisfaction degree for the v_D score is 5.28571 corresponding to a 57.14% into being a member of the set Satisfactory and 28.57% in being a member of the set Fair.

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Fulfillment and reliability towards repurchasing from the same brand.

To better understand how the v scores are ranked, we defuzzify v_A , v_B , v_C and v_D scores for the importance degree and satisfaction degree of the fulfillment/reliability attribute towards repurchasing from the same brand, individually for the two groups. In Group 1, for the importance degree, the v_A score is 6.64286, corresponding to a 67.86% into the membership score of being Important and 32.14% into being a member of the set Very Important. Whereas for the satisfaction degree presented by the v_B score is 6.85714 corresponding to a 57.14% into being a member of the set Satisfactory and 42.86% in being a member of the set Very Satisfactory. In Group 2, for the importance degree, the v_C score is 5.64286, corresponding to an 82.14% membership score of being Important and 17.86% into being a member of the set Fair. Whereas for the satisfaction degree the v_D score is 5.92857 corresponding to a 96.43% into being a member of the set Satisfactory and 3.57% in being a member of the set Fair.

With the defuzzification procedure, the weighted average v-scores are now converted into linguistic terms. This analysis allows the study to be more objective with regards to the scales with which the data was collected.

6. CONCLUSIONS & MANAGERIAL IMPLICATIONS

There are three basic questions that the study aims to provide an answer: [i] Which are the strong eTail quality attributes that impact behavioral intents regardless of where a brand is local or global, in this case OXYS vs ASOS brands? [ii] Which are the strong eTail Quality attributes that impact behavioral intents when consumers buy from a local brand, in this case OXYS? And [iii] Which are the strong eTail Quality attributes that impact behavioral intents when consumers buy from a global brand, in this case ASOS?

Attributes that are considered sufficiently strong towards the outcome to happen in both the groups [regardless of being local or global] have been found to be:

Website design towards paying a price premium for the OXYS & ASOS brand.

Based on the cases that were studied; being aware of the brand or not being aware of the brand has not much influence in terms of paying a price premium for an e-commerce platform that offers a website design which is considered great by the user. The characteristics of a great website design are: great look, user friendly and easy to navigate, fast loading of pages and finally offering convenience. These findings can be supported through previous literature on website design and user satisfaction from a transaction, which relates to brand loyalty intention (Chen et al., 2006), points out that a well-designed site has a number of beneficial impacts, such as trust and confidence in the company as well as building on the image, functionality, and usefulness. Alongside these beneficial it can as well inform visitor to the company's range of products and services and reasons to come back again (Toufaily, Ricard and Perrien, 2013). According to Pastrick (1997), offering e-commerce website designs which are fast, uncluttered and easy-to-navigate has statistically proven to offer pleasure and satisfaction for the website surfer. The cases that we studied, report to perceive that website design is a member of the set Satisfactory by 67.86% in Group 1 and 71.43 % in Group 2. This finding based on the theory of fuzzy sets (Zadeh, 1965), appears to be sufficient for the price premium paying outcome to happen. Even though, website design has been studied redundantly from previous researches, there are still strong researches showing that it still remains one of the main dimensions of online service quality that impact loyalty (Collier and Bienstock, 2015)

Fulfillment and reliability towards repurchasing from the same brand.

In this study, fulfillment and reliability was defined with these elements: the company takes a special care on the product description and the compatibility with the products that will be shipped; a set timing of the dispatch and shipping process, and the opportunity to receive a new product if the product that was sent appears to be defective.

Based on the analysis that we conducted it is proved that e-commerce platforms that offer fulfillment and reliability services as mentioned above are predisposed on pushing customers to repurchase from the same brand either in the case of OXYS or ASOS in the future. According to Jiang and Rosenbloom (2005) the satisfaction related to the delivery timing and reliability appears to have a great influence on the overall customer satisfaction as well as the grows the return intention in order to purchase from the same brand. According to Lee and Lin (2005), the "reliability dimension is a significant predictor of overall service quality, customer satisfaction and purchase intentions in online shopping." The cases that we studied, report to perceive that fulfillment/reliability is a member of the set Very Satisfactory by 57.14% in Group 1 and in the set Satisfactory 96.43 % with regards to Group 2.

With regards to the analysis towards the eTail Quality attributes that impact behavioral intents towards a global brand customer service appears to be sufficient for both the outcomes: paying a price premium and repurchasing in coming occasions. Customer service expresses the relationship between the customer and the company. If customers are satisfied with the service offered this link strengthens which results in greater perception of service quality. According to Sundharesalingam and Padmanabhy (2016), for online businesses, the first ranked variable for retaining customers to increase the customer loyalty base was characterized the customer service.

Withdrawn

REFERENCES

- Alpar, Paul. "Satisfaction with a web site: Its measurement, factors and correlates." In *Electronic Business Engineering*, Physica-Verlag HD, (1999): 271-287
- ASOS. "About us." *ASOS Accessed* 02.02. 2015. <http://www.asos.com/about/>
- Bakos, Yannis. "The emerging role of electronic marketplaces on the Internet." *Communications of the ACM* 41 (8) (1998): 35-42
- Bojadziev, George., and Maria. Bojadziev. 2007. *Fuzzy logic for business, finance, and management.*: World Scientific Publishing Co
- Blut, M., Chowdhry, N., Mittal, V. and Brock, C., E-Service Quality: A Meta-Analytic Review. *Journal of Retailing*, 91(4), (2015): 679-700
- Chaffey, Dave. (2007) *E-business and E-commerce Management: Strategy, Implementation and Practice.*: Pearson Education
- Chen, Shyi-Ming "Evaluating weapon systems using fuzzy arithmetic operations." *Fuzzy sets and systems* 77 (3) (1996): 265-276
- Chien, Cheng-Ju., and Hui-Hua. Tsai "Using fuzzy numbers to evaluate perceived service quality." *Fuzzy Sets and Systems* 116 (2) (2000): 289-300
- Chiu, Sheng Yang, Sze Yin Ho, Jessica. (2015) "Local vs. Global Brands: Country-of-Origin's Effect on Consumer-based Brand Equity among Status-Seekers." *Journal of Economics and Behavioral Studies* 7 (3)
- Christensen, Larry B., Burke, Johnson, and Lisa A. Turner. (2011) *Research methods, design, and analysis.*: Allyn & Bacon
- Collier, J.E. and Bienstock, C.C., A conceptual framework for measuring e-service quality. In *Creating and Delivering Value in Marketing*, Springer International Publishing (2015): 158-162
- Culnan, Mary K., and Pamela J. Armstrong. "Information privacy, consumer procedural fairness, and impulse buying: An empirical investigation." *Organization science* 10 (1) (1999): 14-35
- Dubois, Didier., and Henri. Prade. "A review of fuzzy set aggregation connectives." *Information Sciences* 36 (1) (1985): 85-121
- EM Steenkamp, Jan-Benedict, Rajeev Batra, and Dana L.Alden. "How perceived brand globalness creates brand value." *Journal of International Business Studies* 34 (1) (2003): 53-65
- Friedman, Batya., Peter H. Khan Jr, and Daniel C. Howe. "Trust Online." *Communications of the ACM* 43 (12) (2000): 34-40
- Gustafsson, Anders, Janjaap Semeijn, Allard C. R. van Riel, Marcel J. H. van Birgelen, and Sandra Streukens. "E-services and offline fulfilment: how e-loyalty is created." *Managing Service Quality: An International Journal* 15 (2) (2005): 182-194
- Hoffman, Donna L., Thomas P. Novak, and Marcos. Peralta. "Building consumer trust online." *Communications of the ACM* 42 (4) (1999): 80-85
- Jacoby, Jacob., and David. Kyner. "Brand loyalty vs. repeat purchasing behavior." *Journal of Marketing Research* (1973):1-9
- Jiang, Pingjun., and Bert. Rosenbloom. "Customer intention to return online: price perception, attribute-level performance, and satisfaction unfolding over time." *European Journal of Marketing* 39 (1/2) (2005): 150-174

- Keller, Kevin Lane. (2012) *Strategic Brand Management Building, Measuring, and Managing Brand Equity*. Vol. 4: Prentice Hall
- Klir, George., and Bo. Yuan. (1995) *Fuzzy sets and fuzzy logic*. Vol. 4. New Jersey: Prentice Hall
- Lee, Gwo-Guang, and Hsiu-Fen Lin. "Customer perceptions of e-service quality in online shopping." *International Journal of Retail & Distribution Management* 33 (2) (2005):161-176
- Liu, Chang, and Kirk P. Arnett. "Exploring the factors associated with Web site success in the context of electronic commerce." *Information & Management* 38 (1) (2000): 23-33
- Loiacono, Eleanor, Richard Watson, and Dale Goodhue. "WebQual: An Instrument for Consumer Evaluation of Web Sites." *International Journal of Electronic Commerce* 11 (3) (2007):51-87
- McGovern, Gerry. "Content builds brands online." *International Journal on Media Management* 3 (4) (2001): 198-201
- Miyazaki, Anthony D., and Ana. Fernandez. "Consumer perceptions of privacy and security risks for online shopping." *Journal of Consumer Affairs* 35 (1) (2001): 27-44
- Novak, Thomas., Donna L. Hoffman, and Yiu-Fai. Yung. 2000. "Measuring the customer experience in online environments: A structural modeling approach." *Marketing Science* 19 (1):22
- Oliver, Richard L. "Whence consumer loyalty?" *Journal of Marketing* (1999): 33-44
- Parasuraman, Anantharanthan. Zeithaml, Valarie A., and Leonard L. Berry. "A conceptual model of service quality and its implications for future research." *Journal of Marketing* (1985): 41-50
- Pan, Y., Sheng, S. and Xie, F.T., Antecedents of customer loyalty: An empirical synthesis and reexamination. *Journal of Retailing and Consumer Services*, 19(1) (2012):150-158
- Pastrick, Greg. "Secrets of great site design." *InternetUser* (1997): 80-87
- Ratner, James, Gilbert Churchill J and Tom J. Brown "Caution in the use of difference scores in consumer research." *Journal of Consumer Research* (1990): 655-662
- Rihov, Eyal, and Charles E. Ragin. 2001. Configurational comparative methods: Qualitative comparative analysis (QCA) and related techniques. *Science*, 290(5481): 1173-1178
- Roselius, Ted. "Consumer rankings of risk reduction methods." *Journal of Marketing* (1971): 56-61
- Rosen, Deborah E., and Elizabeth Purinton. "Website design." *Journal of Business Research* 57 (7) (2004): 787-794
- Roy, Rajat, and Ryan Chau. "Consumer-based brand equity and status-seeking motivation for a global versus local brand." *Asia Pacific Journal of Marketing and Logistics* 23 (3) (2011): 270-284
- Schaffer, Eric. "A better way for Web Design." *Information Week*, (2000): 194
- Schefter, Phil., and Frederick. Reichheld. "E-loyalty: your secret weapon on the Web." *Harvard Business Review* 78 (4) (2000): 105-113
- Sharma, G. and Lijuan, W., The effects of online service quality of e-commerce Websites on user satisfaction. *The Electronic Library*, 33(3), (2015): 468-485
- Srinivasan, Srin S., Rolph. Anderson, and Kishore. Ponnnavolu. "Customer loyalty in e-commerce: an exploration of its antecedents and consequences." *Journal of Retailing* 78 (1) (2002): 41-50
- Sundharesalingam, P. and Padmavathy, S., A Comparative Study on Customer Satisfaction and Retention Strategy in Public and Private Sector Banks. *Asian Journal of Research in Social Sciences and Humanities*, 6(4), (2016): 563-583

- Tassabehji, Rana, and Inc. Ebrary. 2003. Applying E-commerce in business: SAGE Publications.
- Toufaily, E., Ricard, L. and Perrien, J., Customer loyalty to a commercial website: Descriptive meta-analysis of the empirical literature and proposal of an integrative model. *Journal of Business Research*, 66(9), (2013): 1436-1447
- Wolfinbarger, Mary., and Mary C. Gilly. "eTailQ: dimensionalizing, measuring and predicting eTail quality." *Journal of Retailing* 79 (3) (2003): 183-198
- Zadeh, Lotfi A. "Fuzzy sets." *Information and control* 8 (3) (1965): 338-353
- Zadeh, Lotfi A. "Toward a perception-based theory of probabilistic reasoning with imprecise probabilities." *Journal of statistical planning and inference* 105 (1) (2002): 233-264
- Zeithaml, Valarie A. "Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence." *Journal of Marketing* (1988): 2-22
- Zeithaml, Valarie A., Leonard L. Berry, and A. Parasuraman. "The Behavioral Consequences of Service Quality." *Journal of Marketing* 60 (2) (1996): 31
- Zhang, Yinlong, and Adwait Khare. "The Impact of Accessible Identities on the Evaluation of Global versus Local Products." *Journal of Consumer Research* 36 (3) (2009): 524-537
- Zimmermann, Hans-Jürgen. (2001) Fuzzy set theory—and its applications.: Springer Science & Business Media

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APPLICATION OF COURNOT'S MODEL ON A COUPLE'S BUDGET ALLOCATION

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ABSTRACT

Budget allocation of the couples belongs to the field of family finance management, but also represents a source of dispute among them, which directed the research of this topic towards family therapy and psychology. This paper will offer quantitative approach, implementing Cournot's duopoly model to a situation of a couple's budget allocation. That will emphasize the underlying economic principles, as well as show that there exists an equilibrium solution or an equilibrium set of possible solutions.

Keywords:

applied game theory, couple decision-making, family finance management

1. INTRODUCTION

This paper will consider a newly wedded couple deciding on the amount of money they should save or invest. They both understand that it is useful to save money, but the deviation tendency for spending money is high. However, for the purpose of this paper this couple will aim for a rational answer. We will assume that one person prefers to spend the money, while the other prefers to save the money. The two players compete over the dominance of the budget. That provides the situation framework which requires game theory as a methodology. Therefore, this situation will be modeled using game theory framework, precisely Cournot's model. Game theory is mathematical discipline dedicated to analysis and anticipating human behavior in strategic situations. Requirements of the game theory also have to be satisfied: there has to be at least two players, players have to interact strategically, feasible strategies have to be described, as well as available information, pay offs and players' preferences regarding the pay offs. That will result in formalization of bargaining stage on personal budget allocation.

The application of the Cournot's model to a situation where a couple has to decide on saving and spending of their limited budget will show that (1) division of the limited budget by a couple follows same economic principles as duopoly market division; (2) there is an equilibrium solution or an equilibrium set of possible solutions. In addition, offered equilibrium solution can be adjusted/ extended and compared to existing models questioning the deviations from the equilibrium, such as deviation towards non reporting income, expenses for child from previous marriage, transfers given the amount of caring and deviations due to personality characteristics. The model results can relate to existing model's results providing a simulation with empirical data as confirmation for each.

Secondary data will be implemented in the model using compilation method. The aim of this model is to answer what is the optimal behavior of participants in observed game from a new, different perspective, such that it can be applicable both in everyday life and can serve for further scientific research and model development. Moreover, this Cournot's model implementation can serve as a basis for future empirical research of this topic.

2. LITERATURE REVIEW

Financial arguments are common part of couples' interaction, and has been previously documented and studied by numerous authors. Family financial management requires decision-making of many situations, such as spending, savings, retirement plan, buying choices, plan for children and their expenses, residence choice, and so on. Godwin (1990) noticed that at the time, there was many literatures on what couples should do, but very few research on how couples actually behave in

this situations. Since then, a numerous researches have been conducted and most of them found that financial problems and financial argument influence marital satisfaction (Kerkmann et al., 2000). Lawrence et al (1993), found that savings and pursuing goals were negatively correlated with arguing, and cost-cutting strategies, delaying and do-it-yourself are positively correlated to arguments. The same author relays of the research of Goodman, 1986, Mitchell and Zalenski, 1985, Yankelovich, Skelly, & White, 1975, which found that from one-third to over one-half of their respondents argue about finances.

Guiso and Sodini (2013) use the term household finance, and state related issues such as financial mistakes, financial literacy, portfolio allocation, debt decision and consumer financial regulation. According to these authors, "household finance is the normative and positive study of how households use financial markets to achieve their objectives". Even though they pointed out to required interdisciplinarity when dealing to this topic, they do not engage deeply into decision-making process.

Further literature review shows that the research of this topic has been transferred from personal finance to the field of family therapy and self-help psychology (Post, 2005, Wilson, 2012). Almost forty years after first significant studies in this field, Queen et al., (2013) state that research on decision making in couples is yet at an early stage of development. The same authors develop framework for decision making process in couples regarding to decision context, individual characteristics, other social partners and how it effects on the quality of the process. However, authors insist on collaborative decision making.

Modeling cooperative decision making enables forming a descriptive framework, which can be loosely defined for each situation, and in best case shows direction of the decision. The lack of this approach is that enables achieving uniquely defined outcome or a set of possible outcomes. If one wants to do that, should use non cooperative decision making. In combination with other parameters which can be observed in this situation, such as two persons who strategically interact, have different preferences over outcomes and have to agree on making a financial decision, form a framework which requires game theory methodology.

Game theory deals with situations of conflict between two or more participants. The aim is to determine the behavior of participants that best for them, assuming they are rational. Conflict is regulated by strict rules, and the solution of conflicts is determined by the actions of all parties to the conflict. The rules specify the behavior of players. Strategy is a comprehensive plan of action, the rules of the decision or set of instructions that players must abide by taking into account all available prior information about the game (Brkić, 2003). Also, it is important to make distinction between the use of terms of cooperation, as in terms of possibility of making an agreement and as cooperative game theory model which implies that the rules can be changed during the game. Non cooperative, formal models can also allow possibility of making an agreement, moreover the equilibrium solution can be observed

as a rational point of an agreement. The distinction is noted by Malapit (2012: 2), "cooperation implies that couples pool their resources and then jointly decide how these resources are allocated, be it through consensus, Nash bargaining, or some other collective decision making. *** Noncooperation implies that individuals allocate their own resources according to their personal preferences". After clarification of the terms, authors use formal model in order to determine situations in which spouses have motivation to hide their income. They find that in patriarchal or matriarchal systems, a non-deciding person has a tendency to hide their income. Conrad and Lommerud (2000) offer Cournot - Nash equilibrium model of non-cooperative marriage. Ashraf (2009) shows that in jointly made decisions over budget allocation partners report less money, or keep a secret stash of money. Regarding the bargaining power, influences of threat points such as divorce or departure (Lundberg, Pollak, 1993; McElroy, Horney, 1981). Beside the bargaining power, there are additional influence factors included in modelling budget allocation that can reflect on newlywed couple budget allocation decision, such as expenditure on children from previous marriages (Del Bocca, Flinn, 1994). Chen and Woolley (1999) formed a Cournot-Nash model for a family decision making and examined the transfers within the household given the amount of caring between the spouses. According to Carter and Katz (1997), only transfers within the household are subjective to cooperative decision making.

Decision making and interaction in real life are usually not susceptible to simple rules. Especially at individual level, where personal characteristics take place. The clear connection of personal characteristics to decision-making in game theory has been shown by Tay et al. (2006), Nassiri - Mofakham (2007, 2009), Roozmand (2011), and Škare and Kostelić (2015). Therefore, it is advisable to include behavioral characteristics, as a part of the model, or at least as an orienting parameter. Different kind of behavioral characteristics which represent the boundaries for rational decision making, systematized by Kahneman and Tversky (2003) are called heuristics, biases and cognitive illusions. For the purpose of this paper, personal characteristic will be noted as an orienting factor regarding the preference of outcome.

Influences such as domestic violence (Tauchen et al., 1991), division of housework (Lundberg, Pollak, 1993; Konrad, Lommerud, 1995), and long-term repeated interaction (Chiappori, 1992), investment in mutual children (Ott, 1995) will be disregarded due to the nature of the observed situation. This paper will not discuss sequential interaction, or question consumer or savings choices such as buying preferences or choice of financial products or financial literacy.

This regards to a loosely defined correction parameter of the existential spending. There is a part of the budget required for existential expenses which is usually formed at the national level for four-member monthly necessary expenses (average consumer basket). So, this part of the budget must not be part of the division on the spending and the savings amongst the partners. The average consumer basket has to

be corrected for the number of family members, additional income in family, preferences, personality and life style.

3. METHODOLOGY

Game description. In following game two persons have to define amounts for savings and spending from the mutual budget. We assume that the players have done the market research regarding the products and interest rates. Also, we assume that savings is the first person's preference, while second person prefers spending.

Cournot's model will be used because, in its emphasized features, situation reminds of a duopoly, two companies of approximately same market power compete for the share of the limited market. Each person of the couple is an agent choosing an amount of the limited budget. Applying the Cournot's model (Gibbons, 1992: 14-21; Mas Coleil, Whinston, Green, 1995: 389 - 394, Rasmusen, 2006: 84-86), to the informal declaration of the personal budget allocation is translated into static game of complete information.

The model will be enriched with secondary data. The data source is Croatian bureau of statistics. The Statistical report "Revision of data on basic characteristics of household consumption" provides the data necessary to determine the monthly life expenses. The Statistical report "Statistical Yearbook of the Republic of Croatia" and the data is obtained from Croatian Employment Service regarding every employed person in Croatia. The personal characteristics for implementation in the model will be used from the paper Škare and Kostelić (2015).

Assumptions. First assumption is that static model of complete information can explain the personal budget allocation game. Let the m_1 and m_2 denote the amount of the money, at the disposal of the first and second player, respectively.

Let the

$$u(M) = b - M$$

denotes the possible utility from the savings, where

$$M = m_1 + m_2 \quad .$$

$u(M)$ denotes savings utility, b denotes the amount of joint budget diminished for average cost of life expenses, M is total amount of available joint budget, m_1 denotes the chosen savings amount of the first player, and m_2 denotes the chosen spending amount of the second player.

This leads to utility functions, where $f(U_1)$, utility function of the first player is defined by the preference for investment, while $f(U_2)$ the second player's utility function is defined by the investment diminished by discounting factor revealing his preference for spending. Respectively,

$$f(U_1) = m_1 [r^n - 1] + m_2,$$

$$f(U_2) = m_1 \frac{1}{(1+r)^n} + m_2,$$

and

where r is interest rate.

As it can be noticed, the preferences shape the perception of the gain, which is implemented in the utility function. While first utility function shows preference of $m_1 > m_2$, the second utility function shows preference of $m_1 < m_2$.

There can be derived also a payoff function, π

$$\pi = (U - c) \cdot m,$$

where U denotes utility (result of utility function), c is investment cost, and m is chosen amount of savings.

From this it can be noticed that in observed situation is true $m_1 = m_2 \Rightarrow U_1 \neq U_2 \Rightarrow \pi_1 \neq \pi_2$. The utility functions are different, hence payoff functions are different, so the perceived benefit from the equal amount of savings is different for each player.

Furthermore, a condition $M < b$ has to be satisfied. Parameter b denotes a part of the budget which remains after subtracting average cost of living corrected for factors (number of family members, additional income in family, preferences, life style...) from the total income. Therefore, the amount that remains for spending and for the investment must not exceed b . Otherwise, the situation becomes unsustainable and the family existence is violated, and payoffs tend to 0.

If $M \geq b$, then $u(M) = 0$. Let's assume that the total cost of obtaining savings product is $cm_1 = 0$, hence marginal cost is denoted with constant c , $c = 0, c < b$.

Strategies available for each player regard to the choice of the different amount of budget to obtain. Negative quantities are not feasible strategies. Given that, the set of feasible strategies is $S_1 = [0, b)$, where strategy s_1 denotes chosen amount of money $m_1, m_1 > 0$.

The payoff function for the first player is defined with the payoff functions and the choice of the other player, $u_1(s_1, s_2)$. Let the payoff functions are defined with utility which both players gain, which is rewritten:

$$\pi_1(m_1, m_2) = m_1(u(m_1 + m_2) - c) = m_1[b - m_1 - m_2 - c].$$

Lemma. If a strategy pair (s_1^*, s_2^*) is Nash equilibrium, for each player has to be true $u(s_1^*, s_2^*) > u(s_1, s_2)$, for each feasible strategy $s \in S$. In addition, it has to

solve the optimization problem $\max_{s_1 \in S_1} u(s_1, s_2^*)$.

Respectively, in provided framework is valid

$$\max_{0 \leq m_1 \leq b} \pi_1(m_1, m_2^*) = \max_{0 \leq m_1 \leq b} m_1 [b - m_1 - m_2^* - c]$$

It is assumed that $m_2^* < b - c$ is necessary and sufficient condition for optimization of the first player strategy and leads to

$$m_1 = \frac{1}{2}(b - m_2^* - c)$$

If the strategy pair of chosen amounts of money, (m_1^*, m_2^*) is Nash equilibrium, then for the players rational choices must be true:

$$m_1^* = \frac{1}{2}(b - m_2^* - c)$$

$$m_2^* = \frac{1}{2}(b - m_1^* - c)$$

and

Proof. If, for example, first player would choose to regard to the available budget amount monopolistically, he would choose $m_1 = M$, which leads to maximization of his pay off function, $f(U_1) = M[r^n - 1]$, $\pi_1(M, 0)$, $\pi_1(M, 0)$. Given that there are two players, they would maximize their benefits only if aggregated amounts are equal to monopolistic quantity, which leads to $m_1 = m_2 = \frac{M}{2}$. According to previous derivation it can be seen that $m_1 = \frac{M}{2} = \frac{b-c}{2}$ is not the best answer of the first player to the choice of the second player, because it leads to violating condition that M must not exceed b . That leads to unsustainability of the family existence, and payoffs tend to 0. Hence, $m_1^* = \frac{1}{2}(b - m_2^* - c)$ is the best answer to any chosen amount by second player.

4. RESULTS

When solving the set of equations, it results in

$$m_1^* = m_2^* = \frac{1}{3}(b - c),$$

which satisfies presumed conditions.

This provides the framework form implementation of empirical data.

Average consumption expenditures (existential) per household in 2014 for a four-member family is 81315 Kuna/ yearly or 6776,25 Kuna monthly (Revision of

data on basic characteristics of household consumption¹, 2014: 2), average monthly earnings in Croatia was 5533 Kuna in 2014 (Statistical Yearbook of the Republic of Croatia² 2015: 174).

If we assume that observed newlywed couple has average consumption expenditures and both spouses earn average paycheck, we get that joint budget amount is 11 066,00 Kuna, and monthly consumption expenditures is 3 388,13 Kuna. That means that after covering basic expenses couple has to decide how much to save and spend of the amount of 7 677,87 Kuna. If we implement the data to the previously described situation, we get $m_1^* = m_2^* = \frac{b-c}{3} = 2559,29$ Kuna. Given that the amount of the living cost is corrected only for number of family members, but not for the other factors, it is possible to define that $0 \leq (m_1^*, m_2^*) \leq 2559,29$ Kuna, where couple is indifferent to their allocation, as long as it is within the interval.

Furthermore, tendency for deviation has to be explained.

Deviation towards non-reporting income.

If one of the players would choose to treat the available budget amount monopolistically, and would choose m_1 , he would maximize own profit of $\pi_1(m_1, 0)$, using the amount of money $m_1 = \frac{b-c}{2}$, and gaining $\pi_1(m_1, 0) = \frac{(b-c)^2}{4}$. Given that there are two players, they can only maximize profit if the aggregated⁴ amounts of budget are equal to the monopolistic amount. Deviation towards the monopolistic amount of each player would lead to family survival violation.

So, it can be assumed that the decision maker will choose equilibrium solution, but the non - decision maker will tend to hide money and create a secret stash regardless to the second person preferences.

Let the tendency for deviation is arbitrary quantified to, $d = 1000$ Kuna. The joint budget amount is now 10 066,00 Kuna, and monthly consumption expenditures remain 3 388,13 Kuna. That means that after covering basic expenses couple has to decide how much to save and spend of the amount of 6 677,87 Kuna. If we implement the data to the previously described situation, we get $m_1^* = m_2^* = \frac{b-c}{3} = 2225,96$ Kuna.

The received amount enables non - decision maker to retain control over the budget and generate individual benefit, but diminishes benefit pay offs for both players within the game framework.

1 "The selected sample for 2014 included 4160 dwellings occupied by private households, out of which 2029 private households were successfully interviewed. The response rate at the household level was 54%" (2014:1)

2 "The Labour Cost Survey includes all persons employed in legal entities selected into the sample who signed a work contract with an employer for a fixed or specified period of time, irrespective of whether they worked full time or less than full time and who received wage. Persons who worked on the basis of work agreements or author's contracts, contracts with juveniles' and students' employment services, pupils and students in training and employees who did not receive salaries are excluded." (2015:173)

Deviation because of expenditure on children from previous marriages.

Expenditure on children from previous marriage is a court-ordered obligation, hence increases the amount of monthly consumption expenditures. According to the Croatian Law (314..4.; NN75/14), the obligatory expenditure on children from previous marriages for a parent who earns from 5501 - 6500 Kuna is 1190 Kuna for a child up to 6 years old; 1392 Kuna for a child of 7 - 12 years; 1525 Kuna for a child of 13 - 18 years. Hence, average obligatory expenditure on children is 1369 Kuna.

So, applying this deviation, we get joint budget amount is 11 066.00 Kuna, and monthly consumption expenditures is 4 757.13 Kuna (assuming that there is only one child support paid monthly). That means that after covering basic expenses couple has to decide how much to save and spend of the amount of 6308,87 Kuna. If we implement the data to the previously described situation, we get $m_1^* = m_2^* = \frac{d-c}{3} = 2102,95$ Kuna.

Given that the received amount diminishes benefit pay offs for both players is caused by only one player, the other person has a reason for applying tit for tat strategy which causes deviation from equilibrium solution. The person can do that by keeping the same amount for self or keeping a secret stash. That would diminish the joint budget amount to 9 697 Kuna, leading to choosing amounts of spending and saving of $m_1^* = m_2^* = \frac{d-c}{3} = 1646,62$ Kuna.

It is obvious that this behavior, even though justified, leads only to further diminishing benefit pay offs for both players from mutual budget allocation within the game framework.

Deviation due to transfers within the household given the amount of caring.

For the purpose of examination of the influence of the amount of caring to the household transfers to the equilibrium solution, it is necessary to implement a caring parameter as a preference in the equations.

It is assumed that "caring parameter" contributes to the utility function of one player by increase the utility function of other player. If first player prefers savings over spending and cares for the other player $\mu = 0.5, \mu \in [0,1]$, then his payoff function is defined as $f(U_1) = m_1 [x^n - 1] + \mu m_2$. That leads to $m_1^* = \frac{1}{2}(b - 1.5m_2^* - c)$, while for the purpose of this example, second player remains with his equilibrium choice, $m_2 = \frac{1}{3}(b - c)$. That leads to $m_1^* = \frac{1}{4}(b - c)$, respectively allowing the second player choice $m_2^* = \frac{5}{12}(b - c)$.

This deviation can explain money transfer among the partners where are no expectations in return. In this situation, the amount chosen for savings will be 1919.46 Kuna, while amount chosen for spending will be 3199.11 Kuna. In this case, there is a transfer of 639,83 Kuna from savings to spending due to 0.5 factor of first player

caring for second player. If the second player responds in reciprocity, the observed amount (or a part of it, depending on caring parameter) will be transferred back to the first player.

It can be noticed that the chosen amount of spending violates the first equilibrium outcome set $0 \leq (m_1^*, m_2^*) \leq 2559,29$ Kuna. However, achieved amounts do not violate presumption $m_1^* + m_2^* < b$, hence they are feasible choices - just not the optimal ones.

Deviation due to personal characteristics.

If we assume that observed newlywed couple has some differences over the personality characteristics, and/or general attitudes, we can expect deviation from the equilibrium solution regarding the differences over choosing amount of saving and spending, consumer choices, general preferences, interests, as well as differences over negotiation tactics, communication style, strategies and perception of rational choices.

The differences over negotiation tactics and communication style can be examined in an iterated communication model, namely dynamic model, which exceeds the scope of this paper. The similar situation occurs with discussion of consumer choices and interests.

For the purpose of the discussion of deviation due to personal characteristics, perception of rational choice will be examined. Thinking - Feeling is a personality trait from MBTI personality trait indicator used in modeling a negotiation situation by Škare and Kostelić (2015). It is a personality trait which distinguishes people who generally tend to make rational choices and people who tend to make emotional choices. Let the first player to be rational and second player emotional. It can be assumed that rational player will strive for equilibrium solution, which is rational choice. On the other side, emotional decision makers tend to make impulsive decisions without giving much thought about it. Therefore, sudden expenses can occur.

Emotional decision maker, if aware of own habits, could decide to keep a part of the income for him/ her-self in order to ensure enough resources for impulsive choices. That leads to the same outcome as in already observed example with hiding income. The rational player should anticipate such behavior and suggest this strategy if the emotional player does not come up with that option (in order to forestall possible future disputes).

For the purpose of this example, let the emotional player chooses to keep for himself 500 Kuna. Joint budget amount is 10 566,00 Kuna, and after covering basic expenses couple has to decide how much to save and spend of the amount of 7177,87 Kuna. If we implement the data to the previously described situation, we get $m_1^* = m_2^* = \frac{b-c}{3} = 2392,62$ Kuna. This result fits the assumed set of possible outcomes $0 \leq (m_1^*, m_2^*) \leq 2559,29$ Kuna, where couple is indifferent to their allocation, as long as it is within the interval.

However, the rational player should decide over keeping his part of the budget at disposal for allocation for mutual savings or spending or to keep the same amount of his budget for him/ her-self. Rational choice would be to keep the same amount of his budget for him/her-self, as a tit for tat strategy, which leads to the same outcome as in the example of expenditure on child from previous marriage. In that case, joint budget amount is 10 066,00 Kuna, and after covering basic expenses couple has to decide how much to save and spend of the amount of 6 677,87 Kuna. When we implement the, we get $m_1^* = m_2^* = \frac{b-c}{3} = 2225,96$ Kuna.

Nevertheless, the rational player could have a caring parameter due to which could decide to leave his part of the budget for allocation to mutual savings and spending as a form of transfer given the amount of caring. This does not necessary question his rationality. The caring parameter is implemented in his payoff function, so a following transfer is rational choice for that player, given the presumption of caring. However, it can be discussed in terms of subjective rationality, given that the outcome does not follow simple optimization problem providing objectively rational solution. Subjective rationality can be modeled within the game using both endogenous and exogenous parameters providing a solution which better explains individual choices, but deviates from the classic equilibrium solution. In this case, implementation of caring parameter means that player's choices will be guided by specific personal characteristic, but the outcome will still have an underlining rationality (transfer is rational choice given the player payoff function).

This situation could be modeled in two ways. If we start from the complete budget situation, the caring parameter ascribed to the other player's choice amount would lead to the similar situation as in the example of deviation due to transfers within the household given the amount of caring. The difference is that in this situation transfer among the players enables that emotional player keeps an amount for impulsive spending (not receiving an amount from the partner, but keeping his own, while partner's money remains in joint budget and is used for allocation on spending and savings). Second option is to start from the situation after emotional player has retained the amount and the rational player has played tit for tat. If the transfer occurs in this situation, then the caring parameter should not be assigned to emotional player's chosen amount, but to utility from mutual savings and spending.

5. DISCUSSION

This model describes a glimpse of reality, but it can be used as an example of rational choice in interpersonal bargaining over budget allocation. Although many financial decisions relay on emotions, practice showed that rational choice is preferable in this situation. The presumption of rationality in decision-making process can be critique for this model. The counter argument is that biases and heuristics related to decision-making regarding financial decisions tend to lead to poorer decisions, respectively smaller payoff. Models are often used as an assistance in decision-making. This can be a simple solution manual for this sort of situations, given that it is stated that financial decisions tend to lead to a dispute. Moreover, given that the model can easily be adjusted for each situation it can serve as a simple application.

Each model represents a sort of caricature or abstraction of the situation. The emphasized features of the situation of budget division among spender and saver in the family, look much alike the situation of the duopoly. That was the motivation for the Cournot's model application. The application of the model itself, shows that assumptions and calculations follow both original model and logical flow. Therefore, follows that division of the limited budget by a couple follows same economic principles as duopoly market division.

Given that it was possible to satisfy the required assumptions, the game model provided necessary calculations to achieve the equilibrium outcome. There is a unique solution if we assume player's rationality and disregard behavioral parameter, and decision interval if behavioral parameter is considered. However, that shows that there is an equilibrium solution or an equilibrium set of possible solutions for the application of the Cournot's model to a situation where a couple has to decide on saving and spending of their limited budget. In addition, specific situations have been discussed, such as deviation towards non reporting income, expenses for child from previous marriage, transfers given the amount of caring and deviations due to personality characteristics have been examined and shown that the model results can relate to existing models providing an empirical simulation confirmation for each.

6. CONCLUSION

This paper provides an insight on decision-making process in personal budget allocation. If there are two parties with different preferences, decision may be harder to achieve, but nevertheless it is possible and shown by applying Cournot's model to observed situation. Moreover, it proves that (1) division of the limited budget by a couple follows same economic principles as duopoly market division; and following (2) there is an equilibrium solution or an equilibrium set of possible solutions.

Given that financial decision-making provokes the argument amongst the couples, the conclusions from the game can provide a simple solution manual for this sort of situations. Moreover, the model could easily be adjusted for each situation with specific parameter implementation and it can serve as a simple application. Hence, there is possible use of the findings in everyday life.

This paper represents a framework which can be further developed in future research. Possible future research is regarding the communication iteration, development of behavioral parameter in the model, as well as inclusion of heuristics, biases and cognitive illusions in decision-making process.

REFERENCES

- Ashraf, Nava: "Spousal Control and Intra-Household Decision Making: An Experimental Study in the Philippines", *The American Economic Review*, (2009): 99(4): 1245-77
- Brkić, Luka, *Teorija igara u međunarodnim odnosima*, Gordon, Zagreb, 2003
- Carter, Michael R., Elizabeth G. Katz "Separate Spheres and the Conjugal Contract: Understanding the Impact of Gender Biased Development. In *Intra-household Resource Allocation in Developing Countries: Methods, Models and Policy*", ed. Harold Alderman John Hoddinott and Lawrence Haddad, Baltimore: Johns Hopkins University Press, 1997: 95 - 111
- Chen, Zhiqi, and Frances Woolley, "A Cournot-Nash model of family decision making." *The Economic Journal* 111.474 (2001): 722-748
- Chiappori, Pierre-Andre, "Rational Household Labor Supply", *Econometrica*, 56(1), (1988): 63 - 89
- Chiappori, Pierre-Andre, "Collective Models of Household Behavior, The Sharing Rule Approach". In *Intrahousehold Resource Allocation in Developing Countries, Methods, Models and Policy*, ed. Harold Alderman John Hoddinott and Lawrence Haddad, Baltimore: Johns Hopkins University Press, 1997: 39-52
- Croatian Bureau of Statistics, Revision of data on basic characteristics of household consumption, 2014, <http://www.dzs.hr/>, 28.6.2016.
- Croatian Bureau of Statistics, Statistical Yearbook of the Republic of Croatia 2015, <http://www.dzs.hr/>, 28.6.2016.
- Del Boca, Daniela, and Christopher J. Flinn. "Expenditure decisions of divorced mothers and income composition." *Journal of Human Resources* (1994): 742-761.
- Gibbons, Robert, *Game Theory for Applied Economists*, Princeton University Press, 1992
- Godwin, D. Deborah, "Family Financial Management", *Family relations*, Wiley Online Library, 39, (1990): 221 - 228
- Goodman, M., *Americans and their money: 1986*. *Money*, 15(11), (1986): 159-166
- Guiso Luigi and Sodini Paolo, *Household Finance: An Emerging Field*, *Handbook of the Economics of Finance*, Elsevier, 2013: 1397-1532
- Kahneman, D., Tversky, A., "Maps of bounded rationality", *The American Economic Review*, 93(5), (2003): 1449-1475
- Kerkmann, C. Barbara et al., *Financial Management, Financial Problems And Marital Satisfaction Among Recently Married University Students*, *Association for Financial Counseling and Planning Education*, (2000): 55-65
- Konrad, Kai A., and Kjell Erik Lommerud. "Family policy with non-cooperative families." *The Scandinavian Journal of Economics* (1995): 581-601
- Konrad, K. A., Lommerud, K. E., "The Bargaining Family Revisited", *Canadian Journal of Economics*, 33(2), (2000): 471-487
- Lawrence, C. Frances, et al., *Factors Relating to Spousal Financial Arguments*, *Financial Counseling and Planning*, Volume 4, (1993): 85-95
- Lundberg, S., Pollak, R. A.: "Separate Spheres Bargaining and the Marriage Market", *Journal of Political Economy*, 101(6), (1993): 988-1010

- Malapit, Hazel Jean L. "Why do spouses hide income?." *The Journal of Socio-Economics* 41.5 (2012): 584-593
- Mas-Coleil A., Whinston M. D., Green J. R., *Microeconomic theory*, Oxford University Press, Oxford 1995: 389 - 394
- McElroy, M. B., Horney, M. J.: "Nash-Bargained Household Decisions: Toward a Generalization of a Theory of Demand", *International Economic Review*, 22(2), (1981): 333 - 349
- Mitchell, G. H., and Zalenski, P., Inflation, recession, and economic change: How some Virginia households adjusted, Virginia Cooperative Extension Service, (1985): 354-180
- Nassiri - Mofakham, F., et al., A heuristic personality-based bilateral multi-issue bargaining model in electronic commerce, *International Journal of Human-Computer Studies* 67, (2009): 1-35
- Nassiri - Mofakham, F., et al., A personality- based simulation of bargaining in e-commerce, *Simulation & gaming*, 39, (2008): 83 - 102
- Ott, Notburga. "Fertility and Division of Work in the Family." *Out of the Margin. Feminist Perspectives on Economics*. London, New York: Routledge (1995): 80-99
- Post, Peter, *Essential Manners for Couples - From Snoring and Sex to Finances and Fighting Fair-What Works, What Doesn't, and Why*, William Morrow 2005
- Queen, L. Tara at al., A Framework for Decision Making in Couples across Adulthood, *Handbook of the Economics of Finance*, Volume 2, Part B, (2013): 1397-1532
- Rasmusen E. B., *Games and information*, IV. Edition, Blackwell publishers, Oxford, (2006): 84-86
- Roosmand, O., et al., Agent-based Modeling of Consumer Decision Making Process Based on Power Distance and Personality; *Knowledge-Based Systems* 24, (2011): 1075-1095
- Škare, Marinko, Kostelić, Katarina, Interpersonal communication in the internal marketing: bounded rationalit game theory approach, *Economic Computation and Economic Cybernetics Studies and Research*, Issue 4, (2015): 127 - 149
- Tauchen, Helen V., Ann Dryden Witte, and Sharon K. Long. "Domestic violence: A nonrandom affair." *International Economic Review* (1991): 491-511
- Tay, C., Ang, S., Van Dyne, L., Personality, Biographical Characteristics and Job Interview Success: A Longitudinal Study of the Mediating Effects of Interviewing Self-Efficacy and the Moderating Effects of Internal Locus of Causality, *Journal of applied psychology*, 91 (2), (2006): 446-454
- Wilson, C. Richard, *The family office book - investing capital for the ultra-affluent*, John Wiley & Sons, Inc. Vol. 775, (2012)
- Yankelovich, Skelly, White, *The General Mills American families and their money*, Minneapolis, MN: General Mills, Inc. (1975)

THE INFLUENCE OF STUDENTS' PERCEPTIONS OF UNIVERSITY SOCIAL RESPONSIBILITY ON SATISFACTION, PERCEIVED QUALITY OF SERVICE AND CREDIBILITY

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ABSTRACT

The main purpose of this paper is the validation of the theoretical most important University Social Responsibility (USR) Model, called impact-based model of USR, that explains how students form perceptions. Students' perception will be analyzed in order to determine the influence of their perceptions of satisfaction and quality of service to credibility and its relationships. The reported study examined these relations and tested a proposed model based on the answers of 400 students from University of León, in Spain that provided the input for data analysis with structural equations with modeling with PLS. Our findings show that the impact-based model cannot be applied, so we get a model based on six factors explaining students' view of USR. On the other hand, quality of service, satisfaction and credibility are strongly interlinked and they are influenced by overall perception of the USR. Our findings demonstrate the necessity of investing in USR cross marketing strategies in order to get a quality university that satisfy the need of students and generate trust. The research is replica of a study by Vasquez, Aza and Lanero conducted for a Spanish University (2014), with extension of examining the influence of quality of service to satisfaction and the influence of quality of service, and student satisfaction on credibility.

Keywords:

University Social Responsibility (USR); higher education; quality of service; satisfaction;

quality of service

Withdrawn

1. INTRODUCTION

Although the corporate social responsibility (CSR) concept is especially promoted by multinationals companies, it has become also a prominent issue for universities because they are experiencing a process of world change which materializes into a new way of looking at the approach and purpose of education (Nuñez, Alonso, 2009). Nowadays, institutions of higher education work in a similar competitive environment than any other business organization. This new vision requires that universities act as companies inside the market of educational services, where they should treat their students as customers and improve their competitive advantage through areas such as marketing, enabling them to differentiate and position within this environment.

Social responsibility in higher education symbolizes more than a challenge (Marinescu, Toma, Constantin, 2010), especially since it has become a highly competitive market and both a mature and diversified sector, which it must take advantage of the new opportunities (Burcea, Marinescu, 2011) to improve the quality of service, student satisfaction and university credibility and make good leaders able to set a good example for all human activities that go on beyond the university campus. For this purpose, universities have a crucial role both in the impact it may have the incorporation of social responsibility in the design of its curricula and researches, as well as by incorporating it into its mission, vision and corporate strategy (Muijen, 2004) and educate young people to deal with social problems.

Therefore, it is necessary to consider that a university that promotes university social responsibility (USR) must get a purposeful and rewarding communication with its stakeholders, the knowledge of their expectations and the establishment of means of dialogue with these groups which include social responsibility in university processes and ways of obtaining a competitive advantage in this current context. And can be seen as an organization of quality which it increases students' satisfaction. Also, university responsibility produces an increase of credibility of their reputation and image. Nevertheless, and in spite of the important social function of universities, there are still very few studies that include university stakeholders as the subject of social responsible research (Larrán, López, Calzado, 2012; Peterlin, Dimovski, Uhan, 2011; Vázquez, Lanero, Alves, Gutiérrez, García, 2012).

In this context, the principal aim of this paper is to identify an USR model regarding students' perceptions and analyze whether university responsibility increases students' view about quality of service, and their experiences of satisfaction and credibility. In this respect, and based on the original study Vasquez et al (2014), this paper is organized as it follows. Firstly, we present a review of the four-impact model of USR as the basic theoretical resource for the research. Secondly, we explain the concept quality of service, satisfaction and credibility in higher education. Thirdly, a self-report study carried out with a sample of Spanish university undergraduates is presented in order to characterize students' perception of USR and its implica-

tions for quality of service, satisfaction and credibility (Vasquez et al., 2014). Then, we analyze whether students' global perception of USR affects quality of service, satisfaction and credibility, and identify the relationships between the three previous constructs. Finally, we discuss the results and its implications for the design and implementation of university marketing strategies.

2. CONCEPTUAL BACKGROUND

An USR Model

To start, it is worth mentioning that, as it occurs with the general CSR concept, USR has vague, imprecise, ambiguous and indeterminate definitions (Abril, 2010), and it does not exist an accepted definition by researchers. Furthermore, like other public services, universities have shown less development of social responsibility in their management areas, in spite of their clear social vocation (Melle, 2007).

In the case of Spain, USR has started to be incorporated in the mid-nineties of the last century, but its further development has started from 2003 and 2004, in line with the expansion of CSR and European recommendations, and with the need for higher education institutions to increase their relations with society (Rodríguez, 2010). However, USR commitment has its roots in past experiences such as the legislative progress on social issues (e.g., gender equality, work-life balance, integration of people with disabilities or risk prevention).

USR means offering educational services with an ethical approach, spreading knowledge in a responsible way, good management, respect, developing a sense of responsible citizenship, and encouraging students and academic staff to promote sustainable development in their community and thus, adapt higher education institutions' purposes, views and values in the line with these performances.

There are many definitions of USR. According to European Commission's view (2011), every organization has an impact on society. In the same line, De la Cuesta et al., (2010: 236) states that *"to offer educational services and knowledge transfer following ethical principles, good governance, respect for the environment, social engagement and the promotion of civic values and taking responsibility for the consequences and impacts arising from their actions"*. Therefore, universities have to take responsibility for the effects and consequences caused by their strategies, structures, policies and performances, just like any other organization (Vasquez et al., 2014).

The incorporation of these initiatives involves a new model of integrated universities, based on mainstreaming and maximum participation and involvement of stakeholders through policies, procedures, systems and evaluation indicators.

On the concept and empirical research on USR, different models have been proposed in the literature. Based on Rodríguez (2010) and Vallaeys, De la Cruz, Sasia (2009), we can identify five basic approaches to the concept, as stated in Table 1.:

Table 1.: Different USR models.

Name	Definitions
The traditional academic model	Teach knowledge to satisfy needs.
The modern academic model	Importance of university community but exist boundaries.
The business and instrumental model	Based on evaluation of quality and dialogue with stakeholders.
The pluralistic, global and intrinsic model	Participation of stakeholders, coherent management system, evaluation of results and accountability.
The four impact-based model	Universities cause four different types of impacts around them: educational, cognitive, organizational and social.

Source: Adapted from Rodríguez (2010) and Vallaeys, De la Cruz, Sasia (2009)

- The traditional academic model, which tries to satisfy the global social needs through general knowledge and fight independently.
- The modern academic model, showing the risk of university orientation towards own interests by groups of internal power. However, the university community has a certain importance in this model in spite of the boundaries between university and society.
- The business and instrumental model, which is based on the quality and evaluation, proposing an open relationship between university and society to establish dialogue with stakeholders and contributing to mercantilism.
- The pluralistic, global and intrinsic model, which refers to an integrated social responsibility paradigm with stakeholders and with equal dimensions: a) a new institutional structure for the participation of stakeholders; ii) management system and coherent regulation with this integration; iii) an evaluation of results with consensus; and iv) transparent information and accountability.
- The four impact-based model, which is the most important USR model nowadays.
- The four-impact model has been developed in Latin American universities but has not been tested empirically, that is, from a business perspective, bonding social responsibility to the way organizations manage their impacts on people, society, economy and nature around them (Vallaeys De la Cruz, Sasia 2009). Particularly, it is understood that universities cause four different types of impacts around them: educational, cognitive, organizational and social. Within this view, it is acknowledged that both educational and cognitive impacts are caused by universities themselves as organizations, whereas social and organizational impacts can be caused by both universities and other organizations (Vasquez et al., 2014).

On the other hand, although the idea of USR has been highly debated recently, there are only a few of empirical articles that analyze this field (Dima,

Vasilache, Ghinea, Agoston, 2013). However, several theoretical studies exist to relate with brief description on social responsibility courses as well as on its development throughout history and its format (Christensen et al, Peirce, Hartman, Hoffman, Carrier, 2007; Fernández, Bajo Sanjuán, 2010; Setó-Pamies, Domingo-Vernis, Rabaseda-Figueras, 2011) or with teaching methods on social responsibility in universities and business schools (Balotsky, Steingard, 2006; Caldwell, 2009; Hartman, Werhane, 2010). Therefore, in this paper we use the impact-based model (Vallaey, 2008; Vallaey De la Cruz, Sasia, 2009, Vasquez et. Al, 2014) to propose and test students' overall view of USR. That is:

Hypothesis 1. Students' perceptions regarding the impact-based model positively influence their overall view of USR.

Quality of service

Quality of service has acquired great importance in the education sector in recent years, due to the global and competitive environment in which universities develop their work. Therefore, the concern for quality has spread from the teaching process in general to other levels (Alashloo, Castka, Sharp, 2005), such as the search for and understanding of the background of quality of service, their determinants, and consequences resulting of measurement of quality and implementation of policies for improving it (Abdullah, 2006).

A review of the specialist literature reveals the absence of a consensus on the definition of quality of service, it being considered a polysemous, complex ambiguous, but concrete, multidimensional, relative and elusive concept (Harvey, Green, 1999; Ramasraman et al, Zeithaml, Berry, 1985; Tan, Kek, 2004). According to O'Neill, Palmer (2004) service quality in higher education can be defined as the difference between what a student expects to receive and their perceptions of what really receive. In despite of this problem, this concept has been very popular in recent higher education literature in different countries, such as Australia (Chua, 2004), United Kingdom (Telford, Masson 2005); Spain (Loureiro, González, 2012); Portugal (Oliveira-Brochado, Marques 2007); Singapore (Tan, Kek 2004); Malesia (Abdullah, 2006); Colombia (Cardona, Bravo, 2012), USA (Foropon, Seiple, Kerbach, 2012) or South Africa (De Jager, Gbadamosi, 2010).

Quality of service is a key to attract and keep students on the same university over the years. In turn, universities are instituting social responsibility in education, research, management and extension. Therefore, it is necessary to know whether an increase in USR causes an improvement in quality of service from the point of view of students in order to convince universities of USR importance. Thus, a new hypothesis is proposed by Vasquez et al. (2014):

Hypothesis 2a. Overall perception of USR positively influences quality of service.

Student satisfaction

Student satisfaction is a very important concept for a university and its management (Brown, Mazzarol, 2009) because a satisfied student will recommend the institution to other students and they will decide whether to make another run or any other type of study (Alves, Raposo, 2007; Helgesen, Nettet, 2007) in the same university.

Student satisfaction is a relevant concept because it is directly related to student retention as is the main antecedent of customer loyalty (Westlund, Cassel, Eklöf, Hackl, 2001; Kristensen, Martensen, Gronholdt, 2000; Brown, Mazzarol, 2009). Therefore, knowledge of the determining factors of satisfaction is particularly important. Likewise, being able to measure satisfaction and understand the factors that influence it carries long-term success of the organization, since the absence of satisfaction within a student can have dire consequences for both the university and the student (Popli, 2005). Given the importance of the concept, it is necessary to clarify whether an increase in perceived USR causes an increase in student satisfaction, thus. For this reason, and based on Vasquez et al. (2014), we propose the following hypothesis:

Hypothesis 2b: Overall perception of USR positively influences satisfaction.

Customer satisfaction is rooted in the quality of service concept (Cronin, Taylor, 1992). Therefore, when customers perceive that quality of service is higher than expected, they feel satisfied (Arambewela, Hall, 2008). The approach followed is the view of the student as a consumer or client.

Nowadays, many higher education institutions perform some evaluation of the quality of education provided to students, as well as an assessment of student satisfaction. According to the previous literature (Carrillat, Jaramillo, Mulki, 2009; Činčur, Čičić, Čudić, 2011; Muenzel, Alcott, Brown, 2009) quality of service predicts student satisfaction (Vasquez et al., 2014). Hence, we propose the following hypothesis:

Hypothesis 3. Quality of service positively influences satisfaction.

Credibility of University

To test the multidimensionality of the concept Thweatt, McCroskey (1998), **postulated that credibility consists of three main components:** i) competition understood as knowledge and/or experience of the person or organization analyzed; ii) the reliability or confidence on the honesty and goodness; and finally, iii) the perceived caring, (i.e., concern for consumer welfare). The same concept has been applied to the teacher-student relationship (Myers, 2004).

Credibility can also be defined as collective confidence, understanding the term as "a stable ownership group rooted in shared perceptions which affect the reliability of another group or individual" (Forsyth, Adams, Hoy, 2011: 22).

The relationship between these three variables (quality of service, student satisfaction and credibility) has hardly been studied in the previous literature. Although there are numerous studies on satisfaction and quality of service, and even the relationship between both the services sector and the higher education sector, the credibility construct has not been so much less attention relative to other variables and the education sector. For this reason, we proposed the following hypothesis:

Hypothesis 4. Quality of service positively influences credibility.

Hypothesis 5. Student satisfaction positively influences credibility.

Hypothesis 3. Quality of service positively influences satisfaction.

3. METHODOLOGY

Self-reported data obtained through a survey tool, is used from the Vasquez et al. (2014). Sampling was based on the total of students of University of León (Spain), ensuring a size for a representative 95 % ($e=+-5\%$; $p=q=0.50$). The sample for this study included 400 responses from students from their last courses, considering the real distributions of students by academic fields and faculties. All respondents participated voluntarily in the questionnaire. "Sample demographic characteristics revealed that 39.8% of participants were males (159) and 60.3% females (241). Respondents' average age was 27.53 years, including ages between 19 to 32 years old. In terms of education, 40% of responders indicated a main academic background on Social and Legal disciplines, 16.5% on Arts and Humanities, 24% on Technical and Engineering, 15.8% on Health and 8.8% on Experimental sciences" (Vasquez et al., 2014: 39).

All respondents answered anonymously to a questionnaire composed of five sets of scales regarding students' overall perception of USR, perceptions of USR impacts, quality of service, satisfaction and credibility.

First, participants were presented a list of 46 items defining specific social responsibility practices in reference to the four categories established by Vallaeys (2008) on four impact-based model and based on the previous literature and review of other similar instruments (Burcea, Marinescu, 2011; Kleinrichert, Albert, Eng, 2010; Sobczak, Debucquet, Havard, 2006; Vallaeys, De la Cruz, Sasia, 2009; Vallaeys, 2014). Particularly, 12 items were used to ask participant about the educational impact, that is, their perceptions regarding the grade of importance given to USR performances in education (e.g., "fostering respect for diversity and equal opportunities among students"). Secondly, 10 items were used to grade the importance given by students to USR performances in research (e.g., "incorporation of sustainable values to scientific research"). Thirdly, 12 sentences were devoted to measure the importance given to USR performances in management (e.g., "work-life balance").

Finally, 12 items were used to ask students about the importance given by their university to USR performances in external projection (e.g., "organizing volunteering programs for students, professors, staff and clerks"). Participants reported their agreement with each item on a five-point Likert scale from 1 (not important at all) to 5 (very important).

Next, a scale of 3 items was used to ask students about their overall perception of USR related to the three economic, social and environmental elements established by Elkington (1997) like an essential part of social responsibility (e.g., "my university has a high potential to contribute to economic development"). Again, respondents reported their degree of accordance with each sentence on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Quality of service was assessed with 5 sentences in reference to authors who have developed quality models in higher education (Abdullah, 2006; Angell, Hefferman, Megicks, 2008; Loureiro, González, 2011). Student satisfaction was measured with 6 items on university performances related to previous literature on this field (Andreassen, Lindestad, 1998; Eklöf, 2000; Fornell, 1992; Fornell Johnson, Anderson, Cha, Bryant, 1996; Johnson, Gustafsson, Andreassen, Lervik, Cha, 2001). Credibility was evaluated with 6 items related to university trust, ethics and justice (Myers, 2004). Again, for each item of these three scales, respondents used Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

4. RESULTS

The data collected was firstly analyzed through SPSS 17.0 in order to identify the dimensions underlying to students' perceptions of USR according to the four impact areas model. Thus, we ran a principal components factor analysis with the 16 items proposed in the first part of the questionnaire used for data collection.

As a previous step to factorial analysis, the suitability of data was assessed. Inspection of the correlation matrix revealed the presence of all coefficients above .60. Also, the Kaiser-Meyer-Okin value was .914, exceeding .60 recommended values (Kaiser, 1977) and the Barlett's Test of Sphericity (Barlett, 1954) reached statistical significance, supporting the factorability of the correlation matrix.

Principal components analysis revealed a better solution of six factors explaining 50.32% of the total variance. These factors were: external projection (6 items), research (5 items), education in environmental values (5 items), internal management (4 items), university-firm relationships (4 items), and education in social values (3 items). The remaining 16 items did not load enough or loaded in several factors and were removed for the analysis.

Then, the partial least squared (PLS) technique was used to test the proposed model (Figure 1), through the statistical program SmartPLS 2.0 (Ringle, Wende, Will, 2005) which allows the estimation of the research model in two stages (Hulland,

1999). First of these implies evaluating the strength of the measurement model (also known as outer model) by looking at item reliabilities, internal consistency, and construct validity. The second stage focuses on the estimation of the fit parameters for the structural model (inner model), thus indicating the fulfillment of hypotheses through standardized path coefficients and the R² index. Likewise, the global fit of the model in terms of predictive relevance is estimated through a jackknife procedure based on the Stone-Geiser test (Geiser, 1974; Stone, 1974). In these terms, the Q² statistic represents a measure of how well observed values are reconstructed by the model and its parameter estimates. Accordingly, we measured the effect of the six factors identified on the students' overall perception of USR and to determine if overall perception of USR produces an improvement in the quality of service and student satisfaction. In addition, PLS technique was used to test the effect of quality of service on satisfaction and the effect of quality and satisfaction on credibility.

Table 2. shows the psychometric properties of the six constructs analyzed: overall perception of USR, perception of USR impacts, quality of service, satisfaction and credibility.

Table 2.: Psychometric properties of scales

Constructs	λ	α	pc	AVE
External projection	.71***	.80	.86	.5
Research	.71***	.75	.84	.51
Education in environmental	.71***	.7	.81	.52
Business management	.72***	.71	.82	.52
University-student relationships	.73***	.85	.88	.53
Education social values	.76***	.76	.84	.54
Overall perception of USR	.83***	.78	.87	.59
Quality of service	.89***	.78	.85	.53
Satisfaction	.81***	.9	.92	.66
Credibility	.80***	.89	.92	.64

λ (loading); α (Cronbach's alpha); pc (composite reliability); AVE (average variance extracted); ***p < .001 (based on two-tailed t-test with 499 df).

Source: Research results

All constructs loadings exceeded the minimum level required for acceptance, 0.5 (Chin, 1998; Barclay, Higgins,Thompson, 1995) and the Table 2. showed some of these results. Moreover, in general the scales were associated to Cronbach's α values of reliability and composite reliability (pc) indicators in order to regarding the internal consistency of scales. The results revealed values over the recommended .70 (Barclay, Higgins,Thompson, 1995; Hair, Anderson, Tatham, Black, 1998; Nunnally, Berstein, 1994). Furthermore, convergent validity was tested by AVE index and all results were above 0.5 level required (Fornell, Larcker, 1981).

Likewise, to test discriminant validity, we verified that each construct shared a larger variance with its indicators than with other constructs of the model (Barclay, Higgins, Thompson, 1995). As Table 3. displays, the square roots of the AVE values (diagonal elements) were greater than the latent variable correlations (off-diagonal elements), thus suggesting satisfactory discriminant validity (Fornell, Larcker, 1981).

Table 3.: Correlations, Square Roots of AVE and Summary Statistics

	1	2	3	4	5	6	7	8	9	10
External projection	.71									
Research	.48**	.71								
Education in environmental values	.55**	.46**	.72							
Internal Management	.36**	.43**	.36**	.72						
University-firm relationships	.67**	.45**	.46**	.35**	.73					
Education in social values	.50**	.44**	.51**	.35**	.48**	.76				
Overall perception of USR	.34**	.35**	.33**	.37**	.29**	.30**	.83			
Quality of service	.37**	.25**	.25**	.31**	.24**	.23**	.56**	.73		
Satisfaction	.22**	.26**	.18**	.26**	.10**	.29**	.51**	.68**	.81	
Civility	.23**	.26**	.19**	.25**	.20**	.24**	.33**	.57**	.70**	.83
M	2.16	2.33	2.11	2.57	2.22	2.45	2.81	2.8	3.05	2.86
SD	0.62	0.64	0.67	0.77	0.67	0.75	0.82	0.74	0.86	0.82

Note. M (mean); SD (standard deviation); Square roots of AVE are in bold. ** $p < .01$ (based on two-tailed t-test with 499 df).

Source: Research results

Once the reliability and validity of the measures were proved, we used PLS program to test the hypothesized relationships between exogenous and endogenous latent constructs. A bootstrapping procedure with 500 subsamples was applied to obtain the t-statistic values (Chin, 1998) of each estimated path in the model. According to that, Table 4. displays the direct effects obtained for the overall sample by this procedure.

Table 4.: Direct effects

Path coefficients	Direct effects β
External projection à Overall perception of USR	.13
Research à Overall perception of USR	.12
Education in environmental values à Overall perception of USR	.09
Internal Management à Overall perception of USR	.22***
University-firm relationships à Overall perception of USR	.01
Education in social values à Overall perception of USR	.06
Overall perception of USRàQuality of service	.57***
Overall perception of USRà Satisfaction	.18***
Quality of serviceà Satisfaction	.60***
Quality of serviceà Credibility	.46***
Satisfactionà Credibility	.38***

*** $p < .01$ (based on two-tailed t-test with 499 df).

Source: Research results

From the above results, we tested previous hypotheses. Hypothesis 1 was partially supported because only internal management (i.e. only one of the impacts of the impact-based model) had a significant effect on the overall perception of USR ($\beta=.22$, $p<.001$). The rest of the five factors had not significant relationship with overall perception of USR.

In line with hypotheses 2a and 2b, it was confirmed a direct effect of overall perception of USR on quality of service and satisfaction with path coefficients of .57 and .18 respectively.

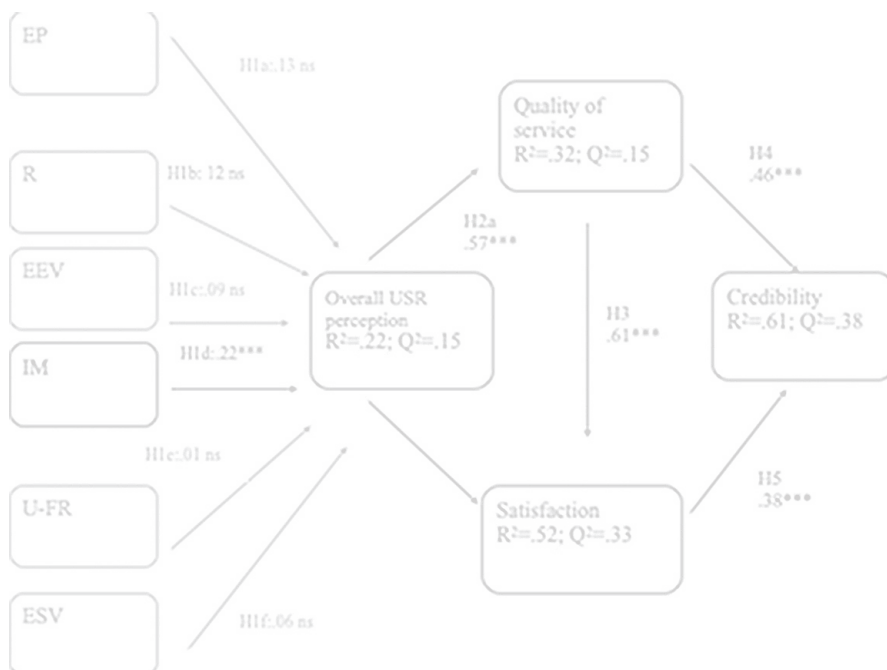
Also, hypothesis 3 was supported because there was a positive effect of quality of service on student satisfaction with a path coefficient of .60.

Next, according to hypothesis 4, the effect of quality of service on credibility was statistically significant ($\beta=.46$, $p<.001$).

Hypothesis 5 was confirmed, as satisfaction was positively related to credibility ($\beta=.38$, $p<.001$).

To aid in the interpretation of this model, Figure 1 shows the empirical model, the path coefficients, their significance level and the R^2 and Q^2 indices obtained. According to R^2 values, the overall model explained 22% of variance in overall perception of USR, 32% of variance in quality of service, 52% of variance in satisfaction, and 61% of variance in credibility. In sum, those values exceeded the minimum .10 (Falk, Miller, 1992). In reference to Q^2 index, it is related with the Stone-Geisser criterion and these results showed that they were consistently higher than zero (Geisser, 1974; Stone, 1974).

Figure 1.: Empirical model



* $p < .05$; ** $p < .01$; *** $p < .001$; ns: non-significant (based on two-tailed t-test with 499 df).

EP: external perception; R: research; EEV: education environmental values; IM: internal management; U-FR: university-firm relationship and ESV: education social values.

Source: Created by the authors.

Withdrawn

5. DISCUSSION

The implications of social responsibility in universities have not been quite studied in recent literature. In general, studies in that field are related to descriptive research (Christensen Peirce, Hartman, Hoffman, Carrier, 2007; Fernández, BajoSanjuán, 2010; Setó-Pamies, Domingo-Vernis, Rabaseda-Figueras, 2011) about a brief description on social responsibility courses as well as on its development throughout history and its format or pedagogical research (Balotsky, Steingard, 2006; Caldwell, 2009), that is, teaching methods on social responsibility in universities and business schools. Analytical research hardly has been studied but it has existed some studies (Moon, Orlitzky, 2011; Sobczak, Debucquet, Havard, 2006). Thus, the motivation of this paper is to carry out a USR empirical survey from students' point of view.

According to that, this paper has shown a model of USR and tested whether it explains students' perceptions of quality of service, t satisfaction, and credibility. In

this way, we generate useful information for marketing university strategies given the importance of maintaining students, preventing their drop out and attracting new ones. Furthermore, we studied the relationship between quality of service and satisfaction in order to aid in the previous literature that concludes that quality of service predicts student satisfaction (Carrillat, Jaramillo, Mulki, 2009; Ćinjurević, Tatić, Avdić, 2010; Molinari, Abratt, Dion, 2008). Finally, we analyzed the relationship between quality of service, satisfaction and credibility in order to describe if those three constructs can be improved from the students' perceptions and experiences regarding USR.

Firstly, the USR model proposed was based on the four university impacts identified as education, research, internal management and external projection in previous theoretical models (Vallaey, 2008; Vallaey, De la Cruz, Sasia, 2009; Valleys, 2014). However, the statistical factor analysis allowed the identification of six factors when defining students' view of USR - external projection, internal management, education in social values, education in environmental values, university-firm relationships and research-. Therefore, the four impact-based model does not identify students' vision of USR. Opposite, our results point to the convenience of dividing the educational impact in the three facets: social, environmental and economical. This is consonant with Elkington's model of CSR, which identifies the three components of economic, social and environmental (Elkington, 1997). From this view, we can conclude that the triple bottom line can be generalized to the USR model in order to get a better understanding of students' experiences regarding responsible education.

Furthermore, only the internal management contributes to students' overall perception of USR. By one hand, this result can be explained because respondents have a better understanding of internal aspects than other responsibilities outside the university daily life that all students may know that university staff's working conditions are good because they are informed about that, whereas research activities are less spread. On the other hand, our findings demonstrate that USR concept is not well-understood by students. Thus, it seems pertinent to improve the students' overall knowledge of all the USR facets, in order to ensure that those perceptions are useful to improve their satisfaction, perceived quality of service and credibility.

In this sense, we proved a positive link between overall perception of USR and perceived quality of service and students' satisfaction. This result suggests the importance of investing in the six factors identified in the USR model for two reasons. The first reason is that students will come to a university if they consider it as synonymous of quality and satisfactory experience. The second reason is that those universities which promote USR activities, programs and strategies will have a competitive advantage over the others.

Thirdly, we verified the positive effect of quality of service on student satisfaction as suggested by the previous literature. Therefore, both of them are two inseparable constructs in higher education research.

Finally, the credibility findings suggest that the effect of quality of service and student satisfaction on university credibility depends largely on the overall perception of USR. Therefore, if a good cross strategy USR is got, quality of service and satisfaction are improved, which in turn enhances the credibility of the institution from the perspective of current and future students. Additionally, this situation leads to improvement of university's standing and notoriety reduces the dropping out of students and attracts others.

The findings from this study raise several other interesting research questions and future research lines. While this paper proposes an exploratory analysis of students' perceptions on USR, further research is to be carried out on this topic because currently, there is an insufficient theoretical development in this framework. Thus we should require new studies with different measures of this construct. Furthermore, since data was collected at one single Spanish university, further comparative studies carried out in other settings would be recommended. Besides it would be convenient to complement this model with other variables, such as students' previous knowledge of USR.

Withdrawn

REFERENCES

- Abril, A.: *Prólogo*. In de la Cuesta González, M., de la Cruz Ayuso, C., and Fernández, (2010)
- J. M. R. (eds.), *En Responsabilidad social universitaria*, Netbiblo, La Coruña, xiii
- Alashloo, F. R., Castka, P., and Sharp, J. M., Towards understanding the impeder of strategy implementation in higher education (HE): A case of HE institutes in Iran. "Quality assurance in education", 13(2), (2005): 132-147
- Alves, H., and Raposo, M., "Conceptual model of student satisfaction in higher education. *Total Quality Management*, 18(5), (2007): 571-588
- Andreassen, T. W., and Lindestad, B., "Customer loyalty and complex services: the impact of corporate image on quality, customer satisfaction and loyalty for customers with varying degrees of service expertise". *International Journal of Service Industry Management*, 9(1) (1998): 7-23
- Angell, R. J., Heffernan, T. W., and Megicks, P., "Service quality in postgraduate education", *Quality Assurance in Education*, 3, (2008): 236-254
- Arambewela, Rodney, and John Hall. "A model of student satisfaction: International postgraduate students from Asia." *E-European Advances in Consumer Research Volume 8* (2007)
- Balotsky, Edward R., and David S. Steingard. "How teaching business ethics makes a difference." *Journal of Business Ethics Education* 3 (2006): 5-34
- Barclay, Donald, Christopher Higgins, and Ronald Thompson. "The partial least squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration." *Technology studies* 2, no. 2 (1995): 285-309
- Bartlett, Maurice Stevenson. "A note on the multiplying factors for various χ^2 approximations." *Journal of the Royal Statistical Society. Series B (Methodological)* 16(1) (1954): 296-298
- Brown, Robert H., and Tiratso, Wilfrido. "The impact of service quality on customer satisfaction and loyalty in higher education." *Higher Education* 58, no. 2 (2009): 151-165
- Burcea, Maria, and Popa, Maria. "Students' perception of corporate social responsibility at the academic level. Case study: the faculty of administration and business, University of Bucharest." *Amfiteatru Economic* 13, no. 29 (2011): 207-220
- Caldwell, Cam. "A ten-step model for academic integrity: A positive approach for business schools." *Journal of Business Ethics* 92, no. 1 (2010): 1-13
- Melchor Cardona, Madeline, and Juan José Bravo. "Service quality perceptions in higher education institutions: the case of a colombian university." *Estudios Gerenciales* 28, no. 125 (2012): 23-29
- Carrillat, François A., Fernando Jaramillo, and Jay Prakash Mulki. "Examining the impact of service quality: a meta-analysis of empirical evidence." *Journal of Marketing Theory and Practice* 17, no. 2 (2009): 95-110
- Chin, Wynne W. "Commentary: Issues and opinion on structural equation modeling." (1998): vii-xvi
- Christensen, L. J., Peirce, E., Hartman, L. P., Hoffman, W. M., and Carrier, J., (2007). Ethics, CSR, and sustainability education in the financial times top 50 global business schools: Baseline data and future research directions. *Journal of Business Ethics*, 73(4): 347-368
- Chua, C., "Perception of quality in higher education", Proceedings of the Australian Universities Quality Forum, Adelaide, (2004): 181-186. AUQA Occasional Publication

Činjurević, Merima, Kasim Tatić, and Armin Avdić. "An integrated model of price, service quality, satisfaction and loyalty: An empirical research in the banking sector of Bosnia and Herzegovina." *Economic Research- Ekonomska Istraživanja* 23, no. 4 (2010): 142-161

Comisión Europea, "Estrategia renovada de la UE para 2011-2014 sobre la responsabilidad social de las empresas" (25.10.2011 COM (2011) 681 final). Retrieved from <http://eur-lex.europa.eu/legal-content/ES/ALL/?uri=CELEX:52011DC0681>

Cronin Jr, J. Joseph, and Steven A. Taylor. "Measuring service quality: a reexamination and extension." *The journal of marketing* (1992): 55-68

De Jager, Johan, and Gbolahan Gbadamosi. "Specific remedy for specific problem: measuring service quality in South African higher education." *Higher Education* 60, no. 3 (2010): 251-267

de la Cuesta González, M., Del Río, A.P., Robledo, I.S. and Paunero, D.S., 2010. Compromiso social de la UNED. In *Responsabilidad social universitaria* (pp. 233-272). Netbiblo

Dima, Alina Mihaela, Simona Vasilache, Valentina Ghinea, and Simona Agoston. "A Model of Academic Social Responsibility." *Transylvanian Review of Administrative Sciences* 9, no. 38 (2013): 23-43

Eklöf, Jan A. "European customer satisfaction index pan-European telecommunication sector report based on the pilot studies 1999." *European Organization for Quality and European Foundation for Quality Management*, Stockholm, Sweden (2000)

Elkington, J.: *Cannibals with forks*. Capstone, (1997)

Falk, R. Frank, and Nancy B. Miller. *A primer for soft modeling*. University of Akron Press, 1992.

Fernández Fernández, J.L. and Sanjuán, A.B., The presence of business ethics and CSR in the higher education curricula for executives. *Journal of Business Ethics Education*, 7, (2010): 25-38

Fornell, C., A national customer satisfaction barometer: The Swedish experience. *the Journal of Marketing* 1993, 57, 6

Fornell, C., Johansson, D., Persson, M., Chakrabarty, S., Bryman, A., *Customer satisfaction on independent purpose and finding*, the *Journal of Marketing* (1996): 7

Forner, Claes, and Einar F. Isaksson. "Combining structural equation models with observable variables and measurement error." *Journal of marketing research* (1981): 39-50

Foropon, Cyril, Ruth Seiple, and Laoucine Kerbach. "Using servqual to examine service quality in the classroom: analyses of undergraduate and executive education operations management courses." *International Journal of Business and Management* 8, no. 20 (2013): 105

Forsyth, Patrick B., Curt M. Adams, and Wayne K. Hoy. *Collective Trust: Why Schools Can't Improve without It*. Teachers College Press. 1234 Amsterdam Avenue, New York, NY 10027, (2011)

Geisser, Seymour. "A predictive approach to the random effect model." *Biometrika* 61, no. 1 (1974): 101-107

Frambach, Ruud T., Harry G. Barkema, Bart Nooteboom, and Michel Wedel. "Adoption of a service innovation in the business market: An empirical test of supply-side variables." *Journal of Business Research* 41, no. 2 (1998): 161-174

Hartman, Laura P., and Patricia H. Werhane. "A modular approach to business ethics integration: At the intersection of the stand-alone and the integrated approaches." *Journal of Business Ethics* 90, no. 3 (2009): 295-300

Harvey, Lee, and Diana Green. "Defining quality." *Assessment & evaluation in higher education* 18, no. 1 (1993): 9-34

Withdrawn

- Helgesen, Øyvind, and Erik Nesset. "Images, satisfaction and antecedents: Drivers of student loyalty? A case study of a Norwegian university college." *Corporate Reputation Review* 10, no. 1 (2007): 38-59
- Hulland, John, and Richard Ivey School of Business. "Use of partial least squares (PLS) in strategic management research: A review of four recent studies." *Strategic management journal* 20, no. 2 (1999): 195-204
- Johnson, Michael D., Anders Gustafsson, Tor Wallin Andreassen, Line Lervik, and Jaesung Cha. "The evolution and future of national customer satisfaction index models." *Journal of economic Psychology* 22, no. 2 (2001): 217-245
- Bentler, P. M. "Factor simplicity index and transformations." *Psychometrika* 42, no. 2 (1977): 277-295
- Kleinrichert, D., M. Albert, and J. P. Eng. "The role of corporate values on business students' attitudes: a comparison of undergraduates and MBAs." *The Business Review*, Cambridge 17, no. 1 (2011): 53-59
- Kristensen, Kai, Anne Martensen, and Lars Gronholdt. "Customer satisfaction measurement at post Denmark: results of application of the European customer satisfaction index methodology." *Total Quality Management* 11, no. 7 (2000): 1007-1015
- Larrán, M., A. López, and Y. Calzado. "Stakeholder expectations in Spanish public universities: an empirical study." *International Journal of Humanities and Social Science* 2, no. 10 (2012): 1-13
- Correia Loureiro, Sandra Maria, Miranda Gonzalez, and Francisco Javier. "DUAQUAL: The quality perceived by teachers and students in university management." *Cuadernos de Gestión* 12, no. 1 (2012)
- Marinescu, Paul, Sorin-George Toma, and Ionuț Constantin. "Social responsibility at the academic level. Study case: the University of Bucharest." *Studies and Scientific Researches* 15 (2010): 404-410
- Hernández, Mónica Melle. "La responsabilidad social dentro del sector público." *Ekonomiaz: Revista vasca de economía* 65 (2007): 84-107
- Molinari, Lori K., Russell Abratt, and Paul Dion. "Satisfaction, quality and value and effects on purchase and positive word-of-mouth behavioral intentions in a B2B services context." *Journal of Services Marketing* 22, no. 5 (2008): 363-373
- Moore, Jeremy, and Marek Orlikzky. "Corporate social responsibility and sustainability: A trans-Atlantic comparison." *Journal of Management & Organization* 11, no. 1 (2010): 56-60
- MuijenHeidi, Heidi SCA. "Corporate social responsibility starts at university." *Journal of Business Ethics* 53, no. 1-2 (2004): 235-246
- Myers, Scott A. "The relationship between perceived instructor credibility and college student in-class and out-of-class communication." *Communication Reports* 17, no. 2 (2004): 129-137
- Chicharro, Montserrat Núñez, and Inmaculada Alonso Carrillo. "La responsabilidad social en el mapa estratégico de las universidades públicas." *Pecunia* 9 (2009): 157
- Nunnally, J.C., Bernstein, I.H.: *Psychometric theory* (3rded.). Nueva York: McGraw-Hill, (1994)
- O'Neill, Martin A., and Adrian Palmer. "Importance-performance analysis: a useful tool for directing continuous quality improvement in higher education." *Quality assurance in education* 12, no. 1 (2004): 39-52
- Oliveira-Brochado, A., and Marques, R. C.: *Comparing alternative instruments to measure service quality in higher education*, Universidade do Porto, Faculdade de Economia do Porto, (2007)
- Parasuraman, Anantharathan, Valarie A. Zeithaml, and Leonard L. Berry. "A conceptual model of service quality and its implications for future research." *the Journal of Marketing* (1985): 41-50

- Peterlin, Judita, Vlado Dimovski, Miha Uhan, and Sandra Penger. "Re Thinking the Corporate Social Responsibility in Slovenia: Empirical Evidence." *Economic Research-Ekonomska Istraživanja* 24, no. 4 (2011): 126-142
- Popli, Sapna. "Ensuring customer delight: A quality approach to excellence in management education." *Quality in Higher Education* 11, no. 1 (2005): 17-24
- Fernández, M. R. "Responsabilidad social universitaria: del discurso simbólico a los desafíos reales." *Responsabilidad social universitaria* (2010): 3-24
- Ringle, C. M., Wende S., and Will: *SmartPLS 2.0 (M3) beta*. Retrieved from <http://www.smartpls.de>, (2005)
- Setó-Pamies, Dolors, Misericordia Domingo-Vernis, and Noemí Rabassa-Figueras. "Corporate social responsibility in management education: Current status in Spanish universities." *Journal of Management & Organization* 17, no. 05 (2011): 604-620
- Sobczak, André, Gervaise Debucquet, and Christelle Havard. "The impact of higher education on students' and young managers' perception of companies and CSR: an exploratory analysis." *Corporate Governance: The international journal of business in society* 6, no. 4 (2006): 463-474
- Stone, Mervyn. "Cross-validatory choice and assessment of statistical predictions." *Journal of the Royal Statistical Society. Series B (Methodological)* (1974): 111-147
- Tan, Kay C., and Sei W. Kek. "Service quality in higher education using an enhanced SERVQUAL approach." *Quality in higher education* 10, no. 1 (2004): 17-24
- Telford, Ronnie, and Ron Masson. "The congruence of quality values in higher education." *Quality assurance in education* 13, no. 2 (2005): 107-119
- Theriot, Katherine S., and James C. McCroskey. "The impact of teacher immediacy and misbehaviors on teacher credibility." *Communication Education* 27, no. 4 (1992): 448-463
- Vallaes, François. "La responsabilidad social universitaria: un nuevo modelo universitario contra la mercantilización." *Revista iberoamericana de educación superior* 5, no. 12 (2014): 105-117
- Vallaes, François. "Responsabilidad social universitaria: una nueva filosofía de gestión ética e inteligente para las universidades." *Educación superior y sociedad* 13, no. 2 (2008): 191-220
- Vallaes, François, Cristina De la Cruz, and Pedro M. Sasía. *Responsabilidad social universitaria: manual de primeros pasos*. Inter-American Development Bank, (2009)
- Vázquez, J. L., Lanero, A., Alves, H., Gutiérrez, P and García M.P., An analysis of the reasons attributed by the Spanish undergraduates to CSR in organizations and its implications for consumer behavior. *Economic Research*, Special Edition (2) (2012): 69-82
- Vázquez, J. L., Aza, C. L., Lanero, A.: "Students' experiences of university social responsibility and perceptions of satisfaction and quality of service." *Ekonomski Vjesnik/Econviews: Review of contemporary business, entrepreneurship and economic issues* 28, no. Special Issue (2015): 25-39
- Westlund, Anders H., Claes M. Cassel, Jan Eklöf, and Peter Hackl. "Structural analysis and measurement of customer perceptions, assuming measurement and specifications errors." *Total Quality Management* 12, no. 7-8 (2001): 873-881

A REVIEW OF THEORETICAL AND EMPIRICAL RESEARCH ON HUMAN CAPITAL QUALITY IN CROATIA

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ABSTRACT

Human capital is an important factor of economic growth. Its quality affects the level of available labour's competitiveness. The aim of this paper is to determine human capital quality in Croatia. This paper also tends to indicate the human capital factors in Croatia. Human capital quality is determined by the quality of the education system, than the investment in education and also participation rates in education. When considering the education quality, mainly is to observe the quality of the formal education. The quality of Croatian education system can be measured by quantitative indicators such as numbers of completed years of schooling. But also, by qualitative indicators, which are based on an international comparative research of educational student achievement of different countries. One of these international comparative researches is PISA¹ for pupils in which Croatia is included since 2006. This paper will point out the importance of investment in human capital in Croatia. Insufficient investments in human capital can become the limitation factor to economic growth. According to data from UNESCO², the Croatian public expenditure on education in 2011 amounted to 4.16% of GDP. With that, Croatia is placed below the average³ of OECD countries which amounted in average of 6.1% or to EU countries 5.8% of GDP. An important indicator of human capital quality is also the rate of participation of Croatian population in education. According to the last population census in 2011, Croatia has sufficient educational structure: illiterate less than 1%, with only primary school about 30%, most with secondary education 52%, and the share of highly educated 16.4% (increases over 4% from the last one in 2001). This paper is primarily focused on the review and systematization of the existing literature and studies on the quality of human capital in Croatia. Many researches about the topics on human capital have been indicating to its high importance. The intention is to show if Croatia has recognised the importance of human capital and its quality in comparison to other countries.

Keywords:

human capital quality, formal education, investment in human capital, participation rates

1 Programme for International Student Assessment www.pisa.hr

2 <http://data.uis.unesco.org/?querid=181>

3 <http://www.oecd.org/edu/Education-at-a-Glance-2014.pdf>

1. INTRODUCTION

Many centuries passed before the man, with his abilities, knowledge, creativity and motivation has been recognized as an important factor for economic success. As an economic resource, people are starting to get involved in the economic literature after World War II⁴, but there were also earlier attempts to define the role of knowledge, experience, and skills of employees. Already has A. Smith emphasized the importance of people in the production process over the division of labour and specialization; Marx mentioned the role of science and technology in production; Mill wrote about the quality of human capacity required for work; Schumpeter emphasized the need to recombine knowledge for creating new products.⁵ The concept of human capital is entirely developed in the '60s of the 20th century with the work of Schultz (1961), who looks at the cost of investment in education as an investment in the future, but not as consumption. He adds that by investing in themselves people are able to expand their choices and thus improve their welfare. The key of economic development lies in its people, their skills, knowledge, experience, and health. (Schultz, 1982) Požega and Crnković (2008), on the basis of their study about the impact of continuous and long-term investments in people, their resources and physical assets to economic and social development, conclude that investing in people and their resources can lead to constant and stable economic growth.

Perceiving the importance of human capital, many countries have tried to measure its value in order to determine their current status, or to determine the possibility of improving the level of existing human capital (Kwon, 2009). Most economists are based on a quantitative theory of human capital, as the identification and measurement of its quality is very difficult (Schultz, 1982). Hanushek and Kimko (2000) consider the quality of education, determining economic growth in developed countries, as more important than quantity. Babić (2005) considers that the quality of human capital is determined by the education system's quality, investments in education and participation in education.

Education is considered as the main factor of human capital quality and because of it, it is very important to define the meaning of education quality. Once, it was believed that a school has a big quality if it had a large amount of resources, but today the emphasis is on cognitive and affective achievements of education (Pastuović, 2012). Those achievements are very difficult to measure. The only relevant way of measuring achievements is through reached results in international achievements tests like

4 Pastuović, N., "Edukologija: integrativna znanost o sustavu cjeloživotnog obrazovanja i odgoja", Znamen, Zagreb, (1999)

5 Stengos, T., and A. Savvides, "Human capital and economic growth", Stanford University Press, Stanford, (2009)

PISA, TIMMS and PIRLS⁶, or PIAAC⁷. Except for qualitative indicators, the quality of education can be measured by quantitative indicators, such as schooling rate, dropouts rate, years of schooling (Pastuović, 2012); investing in education (Lowther, 2004; Babić, 2005); enrolment rates (Lowther, 2004; Šošić, 2004); literacy rates, number of lessons, school equipment (Lowther, 2004).

Since the human capital is formed in formal and non-formal education system, it is necessary to explain the formal and informal education. After formal education a person acquired a certain level of education which is publicly recognized. The formal education system in Croatia includes preschool education, primary, secondary, higher education, and lifelong learning. Non-formal education includes education for personal development, but also family education. Informal education includes self-education and self-study and it's realized by television, newspapers, libraries, workshops. (Babić, 2005)

Pastuović (2012) states that both formal and non-formal education are organized and intentional learning; while informal is unintentional and means learning through experience. He adds that according to the level of organization, formal is more organized than the non-formal, but the informal is not organised at all. Babić (2005) states that investments in human capital include investment in education and training on the job, which gives the individual psycho-physical abilities, but also, not less important factor is investment in health, which can increase the productivity of an individual.

Investments in education are shown as a share in total government expenditures or as a share of GDP (Babić, 2005; Lowther, 2004; Šošić, 2004; Nikolić, 2004; Kiss, 2002). According to these indicators, Croatia is investing below the average of OECD or EU countries. In 2011 the share of total government expenditure in Croatia was 8.58%, compared to OECD countries it amounts 12.9%, or to EU countries 11.5%⁸. Investments in education in 2011 in Croatia as a share of GDP are 4.16%, which is, in comparison to OECD or EU countries that have 5.6%, very low⁹. Nikolić (2007) emphasizes the existence of a crisis in financing education in Croatia, considered as the key factor for human capital quality. He shows a series of consequences that inadequate investment in education can have on other inputs, through inadequate material conditions of education, over de-motivated teachers because of inadequate salaries, lower quality in knowledge transmission, and all of that at the end gives worse education output that will not correspond to the labour market needs.

6 Trends in International Mathematics and Science Study and Progress in International reading Literacy Study <http://timssandpirls.bc.edu/>

7 Programme for the International Assessment of Adult Competencies <https://nces.ed.gov/surveys/piaac/> National Center for Education Statistics

8 UIS.Stat data and www.oecd.org Education at a Glance 2013

9 UIS.Stat data and www.oecd.org Education at a Glance 2013

As an output from the educational system, the participation rate in education is used. The participation rate shows educational structure of the Croatian population from 15 years old and over (Babić, 2005) or between 25 and 64 years old (Babić, 2005; Sundać and Krmpotić, 2004; Bejaković, (2004); Šošić, 2004), but also the share of population from 25 to 64 years old participating in lifelong learning (Šošić, 2005; Sundać and Krmpotić 2004; Lowther, 2004; Šošić 2004). The last Population census¹⁰ made in 2011 shows progress in educational structure of the population, but the structure is still, compared to other European countries, unfavourable.

This work is presented in a way that I section shows the character of human capital. It is approached through the definition of human capital. Section II lists the approaches to measuring the value of human capital, and section III illustrates the problem of measuring human capital quality. Section IV refers to the measurement of human capital in Croatia. It provides an analysis of theoretical and empirical research on the method of measuring the value and the quality of human capital in Croatia. The paper tabular presents the indicators that attempt to measure the human capital quality in Croatia. Section V lists the conclusions of various authors about the human capital quality in Croatia, separately for input in human capital, output from education, and quality indicators. The last one, section VI contains guidelines to rising up the level of human capital in Croatia.

2. THE CHARACTER OF HUMAN CAPITAL

The concept of human capital is a combination of human and capital, where capital refers to factors of production, and human "is the subject to take charge of all economic activities such as production, consumption, and transaction"¹¹. Thus understanding, Kwon (2009), human capital can be as one of the factors of production essential for creating new values: "human as a labour force." Kwon (2009) states that, if it is invested in employee's education and training, they can also create new value. According to this presumption, human capital is considered as "human as a creator," which is more important than the previous consideration. Kwon (2009) explained that the empirical studies made in the 50s of the 20th century, present the investment in human capital as an essential element which led to increasing individual's wages, as opposed to quantitative inputs of other factors. Investment in human capital creates additional knowledge and skills that can be transferred to certain goods and services. The accumulation of human capital through education and training affects the increase in individual's wage, company productivity and the national economy in general (Schultz, 1961). Becker (1993) believes that the human capital is

¹⁰ Population census 2011 - Croatia Bureau of Statistic http://www.dzs.hr/Hrv/censuses/census2011/results/htm/ho1_01_36/ho1_01_36_RH.html

¹¹ Kwon, D.-B., "Human capital, and its measurement." Proc. The 3rd OECD World Forum on Statistics, Knowledge and Policy, (2009). p.1

created by investing in man and thus in his education and training, preparation for production, a healthy eating, and in migration.

The impact of human capital, explains Kwon (2009), could be analyzed from three approaches: individual, organizational and social. The individual approach refers to the ability to increase individual wage through increasing their productivity, with also better job opportunities. By creating higher competencies organizations can become more competitive. From the society approach, human capital can affect the level of democracy, respecting human rights, and political stability. Human capital is an accumulation of investment in people, where the education plays its most important role (Mankiw, 2004). Human capital consists of "all human characteristics on which depends the working efficiency of the individual and the organization, and its components are physical health, physical and mental ability, education and motivation for work and development"¹².

Kwon (2009; according to Frank and Bernanke, 2007) defines human capital, from production-oriented perspective¹³, as "an amalgam of factors such as education, experience, training, intelligence, energy, work habits, trustworthiness, and initiative that affect the value of worker's marginal product"¹⁴. Kwon (2009; according to Sheffin, 2003) defines human capital also as "the stock of skills and knowledge embodied in the ability to perform labor so as to produce economic value"¹⁵.

Bogdanović (2008) in his work tries to clarify the ambiguities about the term human capital, which is often identified with the terms of human resources and intellectual capital. A potential is considered, similar to resource, to be transformed into capital. While intellectual capital should be represented more widely than the term of human capital. In order to clarify these terms, the structure of intellectual capital at the micro and macro level is presented. According to the company level, intellectual capital is defined as "all intangible resources that are available to an organization, that give a relative advantage, and which in combination are able to produce future benefits"¹⁶. Meaning that, in the micro level, sub-components of intellectual capital are: human resources, organizational and relational resources. At the macro

12 Pastuović, N., (1999), "Edukologija: integrativna znanost o sustavu cjeloživotnog obrazovanja i odgoja", Znamen, Zagreb, p. 374

13 Kwon (2009) believes that the concept of human capital can be understood according to three aspects: the individual that includes knowledge and skills, but also education, abilities, competency, attitude and behaviour embedded in an individual; in aspect of accumulation of knowledge, it can be acquired through training and experience; in aspects of productivity human capital affects the productivity of the individual.

14 Kwon, D.-B., "Human capital, and its measurement." Proc. The 3rd OECD World Forum on Statistics, Knowledge and Policy, (2009), p.4

15 Kwon, D.-B., (2009), "Human capital, and its measurement." Proc. The 3rd OECD World Forum on Statistics, Knowledge and Policy, (2009), p.4

16 Andriessen, D. and Stam, C., "Intellectual capital of the European Union." McOaster World Congress on the Management of Intellectual Capital and Innovation. Hamilton, Ontario, Canada, (2005), p. 3

level, according to Bontis (2004), it is usual to name the sub-components of intellectual capital with terms of human capital, process capital and market capital. Human capital includes everything that has to do with people; like knowledge, education, competence, with the focus on education. Process capital includes non-human knowledge such as technology, computer, or communication systems, while market capital includes national relationships that create competitive atmosphere. Bontis (2004) also mentions the renewal capital relating to future intellectual wealth with emphasis on R&D.

3. MEASURING HUMAN CAPITAL

It is not possible to measure directly the human capital value, and because of that, many various factors are taken into account while measuring it. Miller (1996) indicates three most common methods of measuring human capital: 1) by the cost of formal knowledge acquisition (education and training); 2) by testing human competence; 3) by methods of productivity assessing based on success's indicators such as: wages level, job security, job status. Pasher (2007), for measuring the value of human capital in Israel, takes into account the following indicators: share of highly educated workforce; share of scientists, technicians and engineers per 10,000 employees; share of female workers in the total working population; the national expenditure on culture and health; people's life expectancy; share of doctors in total population.

Measuring human capital tends to coverage a large number of factors which will, in the most possible credible and realistic way, present the value of people in a country. Measuring the human capital value is needed for a better understanding of factors that affect economic growth, better establishing the connections and influence of education on economic growth, easier assessment regarding the development path to the sustainable development, and for measuring productivity of the education sector.¹⁷

The most meaningful way to measure the human capital value is presented by Kwon (2009), who measures through three approaches: output-based, the cost-based, and income-based. Output-based approach includes: 1) school enrolment rates (Kwon 2009; according to Barro, 1991, Barro and Lee, 1993); 2) accumulated years of schooling in according to the employee's age as education attainment (Kwon, 2009; according to Nehru, Swanson and Dubey 1993); the share of skilled adults in comparison to adults overall (Kwon 2009; according to Romer, 1990); the average number of years of education (Kwon 2009; according to Psacharopoulos and Arriagada, 1986). The cost-based approach is based on the measurement of human capital through the cumulative cost of investing in a human capital. Income-based approach is based on the return on investment in education, mainly referring to individual's income.

¹⁷ Boarini, R., D'Ercole, M. M., and Liu, G., "Approaches to Measuring the Stock of Human Capital: A Review of Country Practices", *OECD Statistics Working Papers*, No. 2012/04, OECD Publishing, Paris, (2012)

Kwon (2009) explains the current measuring method of human capital value, which is based on the OECD measurements. The measurement is similar to the international comparable statistic that relates to investment in human capital, quality, and results of education. The Table 1. below shows the detailed constitution of human capital measurement. The first point refers to quantitative indicators of investment in human capital. The second one shows qualitative results of investing in human capital through international comparison of academic achievement. The third refers to the results of investment in education.

Table 1.: OECD measures on human capital

I. Investment in human capital	High-level qualification	Growth in university-level qualifications Growth in attainment levels in different fields Trend in university-level graduation output Contribution of international students to university graduate output
	Graduation and enrolment rates	Entry rates into tertiary-type A education Entry rates at tertiary education compared to population leaving without completing tertiary Education
	Time invested in education	Instruction time per year Number of hours per week spent on self-study or homework Expenditure per student at different level of education Percentage of GDP spent on educational institutions
	Investment in education	Private and public expenditure Public subsidies for education to households Expenditure on core service, ancillary services, and R&D Change in student numbers, expenditure, demographic forecasts, etc
II. Quality adjustment in human capital investments	PISA assessment PIAAC assessment	
III. Results of education	Matching of education to occupation	
	Labor market outcomes by age, gender, and educational attainment Rates of return to education	

Source: Kwon (2009) p. 8

Boarini, D'Ercole and Liu (2012) consider that the value of human capital can be measured according to: indicators-based approaches and monetary measures approaches. Indicators-based approaches can be seen as: 1) quantitative indicators such as average years of schooling; 2) qualitative indicators such as class size or the international achievements tests results. Monetary measures approaches refer to: 1) cost-benefit approach which includes investing in people according to individual view, government expenditure, and corporate investments; 2) income-based approaches measure the results of investment in people through increasing future earnings; and 3) indirect measure approaches measure "the total stock of human capital as the difference between the total discounted value of each country's future consumption flows and the sum of the tangible components of that wealth, *i.e.* produced capital and the market-component of natural capital"¹⁸.

Kwon (2009) explains that there are also other, modern views on the measurement method of human capital value. This refers to the Human Development Index (HDI)¹⁹, which focuses on the quality of the individual's life and the economic situation but also on the Key Indicators of the Labour Market (KILM)²⁰. HDI is based on health, knowledge, and living standard, including many sub-variables, while KILM is based on 17 indicators of the labour market that are based on the link between education and the process of integration into the labour market, and according to the HDI indicator, Croatia is ranked at 47th place in the world, or at the bottom of the scale in the category Very high human development.²¹

4. HUMAN CAPITAL QUALITY

Hanushek and Kimko (2000) point to the problem of measuring the human capital quality. They indicate that the qualitative aspect of human capital can be created from two sources: 1) inputs in education which may include investments in education or teacher's wages; and 2) "student cognitive performance on various international tests of academic achievement in mathematics and science"²². Lee and Barro (2001) believe that the human capital quality can be measured by educational outputs such as results in student's cognitive skill tests, dropout rates, and repetition rates.

Altinok and Murseli (2007), in a study on a sample of 105 countries, get the comparative qualitative indicators of human capital (QIHC) which are based on

18 Boarini, R., D'Ercole, M. M., and Liu, G., "Approaches to Measuring the Stock of Human Capital: A Review of Country Practices", *OECD Statistics Working Papers*, No. 2012/04, OECD Publishing, Paris, (2012), p. 14

19 http://hdr.undp.org/sites/default/files/2015_human_development_report.pdf

20 International Labour Organization http://www.ilo.org/global/publications/books/forthcoming-publications/WCMS_409035/lang--en/index.htm

21 <http://hdr.undp.org/en/countries>

22 Hanushek, E. A., and Kimko, D. D., "Schooling, labor-force quality, and the growth of nations." *American Economic Review*, (2000), p. 1185

seven different surveys, including PISA, TIMSS, and PIRLS. Similar study has also been made by Hanushek and Kimko (2000), but on the basis of 70 countries' data. This study is based on student achievement in the field of mathematics and science. Lee and Barro's (2001) study is wider because it contains also analyses of the student achievement in the field of reading.²³

As a qualitative indicator of the level of human capital, the cognitive student achievement on international tests like PISA, TIMSS, PIRLS and the PIAAC²⁴ is mentioned. Those tests are based on testing student's achievement in the field of mathematics, science and reading. They aim at obtaining information which enables the comparison of data with other country, and at influencing on education policy, or improving education in general.

PISA is an international survey of 15 years old students in the field of mathematics, science and reading. The testing is carried out on samples of students involved in lower or upper secondary education, depending on the structure of educational system in each country. OECD project initiated due to growing necessity for internationally comparable data about on the quality of education systems and student achievement. The PISA testing is carried out in cycles of three years which allows monitoring of progress. It is focused on education policy, testing student's competence, but also on testing student's motivation for learning and learning strategy.²⁵

IEA²⁶ leads two projects of international student's achievements testing and monitoring their progress in the fields of mathematics, science, and reading. Research in the field of mathematics and science is carried out under the project TIMSS²⁷ in a cycle of four years for students of fourth and eighth grade. The aim is to improve mathematics and science teaching in elementary schools, and with comparable analysis of education policies to determine the advantages of education systems with regard to their organization, curriculum, teaching methods and student achievement. The PIRLS²⁸ project is conducted every five years, for children after completing four years of primary education, in the field of reading, but also considering their experiences in reading, learning at school and at home. The aim is to "provide comparative data, ..., measuring trends over time, monitoring of curricular implementation and identified promising instructional practises"²⁹.

23 The difference between those three studies is also in the kind of countries they observed. Altinok and Murseli (2007) conducted a study on a large numbers of poorest countries, while others were based on richest countries.

24 PIAAC is aimed to compare the basic skills and competences of adults in the world. Croatia is not yet included in the project.

25 www.pisa.hr

26 International Association for the Evaluation of Educational Achievement www.iea.nl

27 http://timss.bc.edu/timss2011/downloads/T11_IR_Mathematics_FullBook.pdf

28 http://timss.bc.edu/pirls2011/downloads/P11_UserGuide.pdf p. 1

29 http://timss.bc.edu/pirls2011/downloads/P11_UserGuide.pdf p. 1

IEA projects and PISA have different outcomes, because they are made with different purposes. PISA has orientation policy, because it measures student achievement on the way to determine the possibility of applying such knowledge and skills in practice, which provides a direct link between curriculum and the policy-makers. IEA projects have research orientation and are more focused on how to teach and learn.³⁰

5. IS THE VALUE OF HUMAN CAPITAL MEASURED IN CROATIA - AND HOW?

The topic on "human capital" is very popular at the moment in Croatia, probably because it has been recognized as an important component of economic development. Research concerning human capital related to economic growth, the labour force competitiveness, education, rates of return on investments in human capital. Studies related to the measurement of the human capital value, or the determination of its quality, are present in smaller volume.

There is no exact method of measuring human capital value, and certainly not its quality, but almost all authors in Croatia agree that its value can be measured by quantitative and qualitative indicators. Quantitative indicators related to the measurement of inputs in the development of human capital, such as enrolment rates, investment in human capital, but also on outputs like schooling rate, rates of returns to education, labour market outcomes by education attainment. The qualitative aspect of human capital is based on qualitative results indicators of international student's achievement tests.

Croatia has started to participate in international testing of the effects of education only in 2006 by involvement in the PISA survey, and only in 2011 in the projects TIMSS and PIRLS. This proves that all research conducted on the subject of human capital, till that period in Croatia, did not contain an essential element of its quality, and that the measurement of student achievement in cognitive abilities was not conducted. The deficiency of the qualitative indicators and the problem of estimating the quality of the Croatian education system are indicated by Lowther (2004), Bejaković (2004), Babić (2005), Šošić (2004).

The impact of human capital on economic growth is unquestionable. Škare (2001) has proved that, in the case of Croatia, only human capital has increasing rates of return as opposed to other factors of economic growth. He emphasises the need to rely on human capital in order to achieve greater economic growth. Tica and Đukec (2008) in assessing the contribution of labour, physical, and human capital to economic growth rates in Croatia, came to conclusion that the share of human capital³¹ in GDP growth is 13%, what is considered relatively low. Returns to education can

30 Wu, M., "Comparing the Similarities and Differences of PISA 2003 and TIMSS. OECD Education Working Papers, No. 32." OECD Publishing (NJ1), (2010).

31 The human capital index is calculated on the basic of educational level and share in earnings

be viewed from the individual or public side and can be economic or non-economic³². While analysing total factor productivity data in Croatia, Raguz, Tica and Družić (2012), for estimating human capital value use two ways of measuring: 1) employment and wages in different levels of educational attainment of the Croatian labour force; and 2) total years of schooling. In grow accounting model of Croatia estimated share of human capital is between 15 - 32%.³³

Human capital is an important determinant of a country's competitiveness, conclude Bejaković (2004) and Sundać and Krmpotić (2009). In an empirical research, Vokić and Frajlić (2004), the Croatian labour force competitiveness observed from the micro aspect, is identified with the value of human capital in Croatian companies. Šošić (2004) believes that "increasing investment in human capital, i.e. education, ... is one of the priorities of the economic policy of developed countries"³⁴, noting that human capital and education are not synonymous, because the concept of human capital also included corporate investment in people, investment in health, gained experience in the workplace. From these findings it is evident that the concept of human capital can almost relate to education, and that is probably so because education is an important factor in the creation of human capital and the education quality directly effects human capital quality. Nikolić (2007) considers that the human capital quality is "determined by the education system quality which provides the acquisition of all the necessary knowledge, skills, and competencies that are required in the labour market"³⁵. Pastuović (2012) indicates that raising the education quality effects directly to increase of the human capital quality, which should be the aim of any advanced education policy. Šošić (2004) considers that human capital value is measured on the basis of achieved education level, where schooling years are taken into consideration, and the educational structure of the working age population, but also on the basis of qualitative indicators measured through standardized international achievements tests. He emphasizes that for forming human capital, there is a crucial influence of other factors such as education quality, non-formal education, and training. Because of that, Šošić (2004) states that indicator of average schooling years is not an appropriate way of measuring the human capital quality.

The human capital quality in Croatia "is determined by the quality of the edu-

32 For detailed overview of economic and non-economic returns to education from individual or public approaches look in Škare, M., Kostelić, K., Justić Jožićić, K. (2013), Does Higher Education Pay off? - Micro an Macroeconomic Policy Implications; The future of economics: Between rules and discretion; Juraj Dobrila University of Pula, pp. 93 - 120;

33 Tica, J., and Grgurev, I., "Relativna važnost faktora rasta u Republici Hrvatskoj." *EFZG Working Paper Series/EFZG Serija članaka u nastajanju* 02: 1-16, (2014), p. 6

34 Šošić, V. (2004), "Isplati li se u Hrvatskoj ulagati u obrazovanje: povrat ulaganja u ljudski kapital kao čimbenik konkurentnosti ljudskih resursa", Institut za javne financije <http://www.ijf.hr/konkurentnost/sosic.pdf>, p. 4

35 Nikolić, N., "Financijska decentralizacija obrazovnog sustava u Hrvatskoj." *Ekonomika misao i praksa* 2: 213-228, (2007), p. 214

cational system, investments in education and participation in education”³⁶, wrote Babić (2005). If we compare this Babić’s (2005) statement with the three segments of measuring the human capital value, which Kwon (2009) presented in the Table 1, it can be concluded that Babić (2005) used precisely these segment indicators, but to determine the quality. Nor do other authors, presented in this paper, keep away from these frames, but the fact is that no other author has taken all indications of measurement that Kwon (2009) presented.

The education system quality is determined as the output quality, where quality is effected through the quality students’ competences, and as output where the quantitative indicators can be: number of persons who have completed school or study, dropout rate and the length of education (Pastuović, 2012). The importance of the formal education system quality is pointed out, as a factor that effects the development of human capital, and thus the competitiveness of human resources in Croatia (Lowther, 2004). He considers that the formal system quality is very difficult to determine, especially because Croatia does not participate in international student’s achievements tests.

Pastuović (2012) indicates that there are very different opinions about the Croatian education system quality, from extremely bad to very positive, which lead him to conclusion that only objective indicators can be considered as indicators of quality, namely: knowledge tests. However, Pastuović (2012) emphasizes, how tests of knowledge results cannot be the only indicators of quality, they can affect the rational management of educational policy. To assess the education system quality, there are some essential indicators: 1) the average national results achieved on international tests in mathematics, science, and reading; 2) the level of equality in educational achievements between certain schools and the national average; 3) the size of socioeconomic impact on academic achievement. Pastuović (2012) further explains that the more the achievements of certain schools are closer to the national average and the smaller the impact of economic, social, and cultural status of families on educational attainment, the education system is better. To assess the education system quality in Croatia, Lowther (2004) based on the following indicators: 1) quantitative indicators such as enrolment rates, literacy rates, electronic literacy, number of classes, government expenditure in education; 2) the results of empirical research made on a sample of 300 Croatian companies whose aim was to found out if the Croatian education system creates necessary knowledge and skills for the current needs of the economy; 3) qualitative studies, particularly the OECD Reviews of National Policies for Education, where he compares the Croatian education system with other countries.

Vokić and Frajlić (2004), in their empirical research about the competitiveness of the Croatian labour force, conducted on 334 Croatian companies in 2003, put the emphasis on the measurement of human capital. They consider the following

36 Babić, Z., “Participacija i ulaganje u obrazovanje u Hrvatskoj.” Privredna kretanja i ekonomska politika 14.101: 28-53, (2005), p. 29

indicators: 1) the knowledge and skills of employees (according to Tintor 1995; Cascio, 2000); 2) the demographic characteristics of the employees: age (according to Sveiby, 1997), years of professional work (according to Cohen and Levinthal, 1990), gender, absenteeism, fluctuation (according to Stewart, 1999; Fitz-enc, 2000); 3) investments in education and development (according to Mayo, 2001); 4) and to the subjective managers opinions. Babić (2005) analyzed the indicators of investment in education through government expenditure and company investment in additional education of their employees, and the participation rates in education including: enrolment rate and people's education structure, as factors that together with qualifying indicators of the education system, affect the quality of human capital. Sundać and Krmpotić (2009) in order to analyze the quality of human capital in Croatia consider: 1) education indicators: the share of population from 25 to 64 years old who completed at least upper secondary education (data taken from Eurostat 2008); the number of students per 1.000 inhabitants; share of the population from 25 to 64 years old who participate in lifelong learning; 2) the working-age population quality: the number of employees according to the total number of working-age population; the number of employees working on the creation of knowledge; the number of researchers employed in research and development per million inhabitants. Bejaković (2004) believes that the workforce competitiveness is determined by educational structure, compatibility of supply and demand for labour in terms of knowledge, expertise, ability, and labour costs. Beside the educational structure of the population, he considers also the number of students per 1.000 population, enrolment rates, dropout rate, and the average duration of study. Šošić (2004), when considering the return on investment in human capital touches on the quality of human capital and observes it with the following indicators: investment in education, the share of the population in education, enrolment rates, dropout rate, and the number of students per 1000 inhabitants.

In order to summarize all the indicators of human capital quality in Croatia the Table 2. is compiled where all analyzed indicators are given. It should be noted that some of the indicators are used to assess the competitiveness of the Croatian labour force, but also to evaluate the education system quality and those will be analyzed also below. In order to facilitate the managing of a large numbers of disorganised indicators, the Table 2. is divided in 3 parts: 1) Measuring the input in human capital by quantitative indicators; 2) Measuring output as results of education by quantitative indicators; and 3) Qualitative indicator.

Table 2.: Indicators for measuring human capital quality in Croatia

INDICATORS		Authors	Babić (2005)	Sundać and Krmpotić (2009)	Lowther (2004)	Vokić and Frajlić (2004)	Bejaković (2004)	Šošić (2004)	Other authors
I. Input in human capital	Government expenditure on education							*	Nikolić (2007) Kiss (2002)
	Company investment in people								Vokić and Grizelj (2007)
	Enrolment rates								
	Dropout rates								Filipić (2009)
	The average duration of study								
	Number of classes								
	Number of obligate in compare to elective subjects								
	The decentralization of educational system								Nikolić (2007)
	Teacher's wage								
	Textbook's price								
II. Output from education	Possibility of teacher's professional development								Gobo (2008)
	School equipment								Economic Institute research (2014)
	People educational structure in age of 15 and more to educational attainment								
	People educational structure in age of 25 to 64 to educational attainment								
	Share of the population from 25 to 64 years old participating in lifelong learning								Čučković and Bartlett (2012)
	The number of students per 1.000 inhabitants								Babić, Matković and Šošić (2006)
	The number of employees according to the total number of working-age population								
	The number of employees working on the creation of knowledge								
	Number of researchers per mil inhabitants								
	Literacy rates				*				
	Electronic literacy (through numbers of computers)								
	Employee's skills (also including subjective managers opinion and employee demographic characteristic)								Economic Institute research (2014)
	Rate of returns from investment in education								
III. Qualitative indicator - The results on the international student's achievements tests									Pastuović (2012) Čučković and Bartlett (2012))

Source: Author's

6. RESEARCH RESULTS

According to the research results, conclusions are given onwards, separately for each indicator.

6.1. INPUT IN HUMAN CAPITAL

Babić's (2005) tabular display presents the government expenditure on education for the period from 1997 to 2001. He considered that expenditure for education is insufficient in comparison with OECD and EU countries. Nikolić (2007) mentions the crisis in financing the education in Croatia. Analyzing the Croatian education system, Lowther (2004), emphasises the problem of financing education because of permanently insufficiency investments, but also the problem of fairness deficiency in allocating resources. Kiss (2002) explains that there is no possibility to increase the government expenditure on education and generates a necessity for finding some other suitable solution for financing it; like sponsorships, donations, direct financing of individuals or companies, opening a large number of private schools. Šošić (2004) considers that government expenditure on education in Croatia does not deviate significantly from the average of developed countries. He explains that, if to government expenditure to education the private investment in education are also added, which amount in Croatia is still estimated³⁷, but he assumes to be at the same level as public, it is obtained an indication that could be almost on the same level as the average of developed countries. The Figure 1 presents trends in government expenditure on education, viewed in total expenditure and in share of GDP, for those years which Babić (2005) presented. The Figure1 contains also newer data obtained from UIS.Stat³⁸. The data shows that the share of government expenditure on education is not drastically changed in the observed period.

Data given in Figure 1 are compared to the OECD and EU countries average. OECD countries in 2011 have an average share of government expenditure on education of 12.9% of total expenditure, while the average share of total government expenditure on education as a share of GDP was 5.6%. EU countries have an average share of government expenditure on education of 11.5% of total expenditure, while the average share of total government expenditure as a share of GDP was also 5.6%. The data indicate that Croatian government expenditure on education, as a share of total expenditures is 8.58%, while the share of total government expenditure as a share of GDP was 4.16%, and compared to the observed averages, is very small.

Based on the research of human resources in Croatian companies, Babić (2005, according to Marusić 1999) concludes that a small amount is invested in the further

37 Through Babić, Matković and Šošić (2006) it is estimated that private investment in high education related to GNP are 0.23%, but only referring to tuition fees. Eurostudent V shows that indirect study cost are 5 time higher than the direct cost or tuition fee.

38 UNESCO Institute for Statistic <http://data.uis.unesco.org/?querid=181>

employees' education. Companies in Croatia invest in education much less than the international and European standards, they invest only in training highly qualified employees. (Vokić and Frajlić 2004.) Through research made by Vokić and Grizelj (2007) of Croatian companies' investments in employee's education, it is found that 68% of companies increased their investment, and the invested amount as a share in total income is an average of 5%.

Lowther (2004) analyzes the enrolment rate in education and concludes the rates are very low in preschool education, very high in primary education, average in upper secondary, and relatively high on tertiary education. Šošić (2004) and Babić (2005) emphasize that Croatia's enrolment rates in preschool education significantly lag behind developed countries. Enrolment rate in preschool education is usually observed from 0 - 2 years old, and from 3 - 5. The share of children from 0 - 2 years old attending preschool education are: 9.6% in 2001; 14.7% in 2008; 18.6% in 2014, and the share of children from 3 - 5 are: 44.3% in 2001; 59.4% in 2008; and 61.4% in 2014³⁹. A significant increase is viewed, but in comparison with EU countries, which have an average enrolment rate of 90% for 4-years old children, Croatia is placed in the group of a very low level with less than 65%⁴⁰. ET 2020 set a target that at least 95% of children between the ages of 4 years until they start primary school should attend preschool education. Enrolment rate in primary education are very high (Babić 2005), in average 96% in the period from 2000 to 2011, but after 2012 it is more than 98%, and in 2014 98.4%⁴¹. The enrolment in high school or tertiary education are increasing through year, but still not satisfying because of high dropout rates and large study duration. The enrolment rate in high school in the period from 2000 till 2011 is in average 85%, and in 2014 92.8%⁴². There are different enrolment rates in tertiary education, depending on study programs⁴³. The student enrolment rate can be calculated for the 2011 and is 63.09%⁴⁴, in comparison to 84% OECD average, or EU 87%⁴⁵, it is very low. The number of students in tertiary education in 2013 is 161.911, and it is shown an increasing of 5.1% in confront to 2011.

Bejaković (2004) touched the dropout rates. He estimated that 1.5% of students do not finish high school, but believes that there is a difference in the rate of

39 UNICEF, TransMonEE Database 2015, <http://www.transmonee.org/databases.php>

40 Eurostat Regional Yearbook 2014, <http://ec.europa.eu/eurostat/documents/3217494/5786237/KS-HA-14-001-03-EN.PDF/43efce65-4b6c-4105-8c93-a6fce178c5ee?version=1.0>

41 UNICEF, TransMonEE Database 2015, <http://www.transmonee.org/databases.php>

42 UNICEF, TransMonEE Database 2015, <http://www.transmonee.org/databases.php>

43 For detailed overview of enrolment rates in different study programs look in Horvat Novak, D., and Hunjet, A., "Analiza učinkovitosti visokog obrazovanja u Republici Hrvatskoj." Tehnički glasnik 9.4: 461 - 468, (2015).

44 Through Population Census 2011 Croatia has 4.284.889 habitants, in the age group 15 - 19 there are 244.177 habitants, and if the number of 154.054 students enrolled in 2011 compares to those age group, there is a share of 63.09%.

45 [https://www.oecd.org/edu/eag2013%20\(eng\)--FINAL%2020%20June%202013.pdf](https://www.oecd.org/edu/eag2013%20(eng)--FINAL%2020%20June%202013.pdf)

school dropout in gymnasium and vocational programs. He emphasizes a high student dropout rate. Even through numerous years of studying, only about 30% of students complete their study in time. According to the number of students enrolled in the first year, only 39% of students graduate, which indicates a very high number of students who interrupt their studies. Šošić (2004) also confirmed that more than 30% of students do not finish their study. Through conducted survey in University of Split, Filipić (2009) finds out that students drop out rate is 25%. ET 2020 set as aim that the dropout rate should be less than 10%.

The average duration of study in Croatia is very long (Bejaković, 2004; Šošić, 2004). Bejaković (2004) states that average duration of four-year study, actually, lasts seven years and two-year higher study lasts five years.

Lowther (2004) thinks Croatian students are deprived soon at the beginning of education, because of lesser number of classes than OECD countries. The schooling of average Croatian student will last 4 years shorter, and thus the knowledge and skills they achieve through education, will be lesser than the OECD country average.

When analyzing the Croatian education system, Lowther (2004), concluded that: the proposed strategy in Croatia has not been implemented or even realized; the education management is strictly hierarchical and the managing is inadequate; there is a large number of obligatory versus elective subjects; textbooks are too expensive according to average Croatian income; teachers' salaries are much lower than the OECD average; teachers do not have the professional development opportunities. According to the teacher's professional development opportunities, Gobo (2008) makes a research through teachers, and finds out that teachers show a greater desire for additional education more than they were offered. The Economic Institute research⁴⁶ finds out that the biggest problem of Croatian educational system is poorly prepared plans and programs, but also unskilled teaching staff. School equipment is generally very poor (Lowther 2004; Economic Institute research 2014).

6.2. OUTPUT FROM EDUCATION

Babić (2005) monitored the share Croatian working-age population in education, through the National Bureau of Statistics data, and gave an overview of the changes from 1961 to the 2001. According to these data, he concluded, the largest increase in the share of working-age population is noted by the population with secondary education. Looking at the data, the improvement in the level of human capital measured by the average number of completed years of schooling is visible. However, it is the improving structure of sufficient quality and how it is compared to other countries, Babić (2005), recognized the need for extensive research. Bejaković

46 Anić, I.D., at al., "Kako pobuditi rast Hrvatskog gospodarstva", Ekonomski institut, Zagreb, (2014)

(2004) also emphasized the lagging of Croatia in education compared to developed countries, but also in relation to some transition countries.

Table 3. contains the changes of Croatian working age population with data from the Population Census 2011. It shows the improvement in almost all aspects of the educational structure. The share of the population with no education and with only primary school education is decreasing, while increasing is the share of secondary and higher education.

Table 3.: Dynamics of Croatian people educational structure in age of 15 and more to educational attainment in % - for the period from 1961 - 2011

	1961.	1971.	1981.	1991.	2001.	2011.
Total	100.0	100.0	100.0	100.0	100.0	100.0
No education and to 3 grade of elementary education	23.5	17.0	13.5	8.6	7.4	2.7
From 4 to 7 grade of elementary education	53.3	43.6	31.9	21.2	11.2	6.9
Finished elementary education	8.6	14.8	19.2	23.4	21.8	21.3
Finished high school ¹	12.6	20.4	28.3	36.0	47.1	52.6
Higher education ²	0.6	1.4	2.7	4.0	4.1	5.8
High education	1.2	2.2	3.6	5.3	7.8	10.5
Unknown	0.2	0.6	0.7	1.5	0.7	0.2

Source: Babić (2005), Author's through data Population Census 2011

Babić (2005) pointed out the educational structure of the population aged between 25 and 64 years old and compared them with the following transition countries: Bulgaria, Czech Republic, Hungary, Slovakia, and Slovenia. He concluded that Croatia does not significantly lag behind them according to educational structure.⁴⁷ Bejaković (2004) states that increasing the share of people over 25 who have high school, higher or high education makes a positive impact on economic competitiveness and GDP growth of the country. He adds that the current education structure, especially in transition countries, unfortunately, does not guarantee the creation of competitive capabilities nor economic development, primarily because the educational systems do not respond to market needs. Sundać and Krmpotić (2009) analyzed the share of population who have completed at least high school, and till 2006 it was 71.10%, and in confront to observed countries, the share does not show a terrible lag. They also pointed out the difficulty in comparing the data

⁴⁷ Except Hungary, that has higher share of people with no finishing the elementary school.

because of different education systems, which means their conclusion could not be certainly correct.

In order to present newer data, Table 4. is compiled, which shows the share of educated population in Croatia in reference to other EU countries.⁴⁸ Without formal education, Croatia has only 1.7% of the working-age population, and compared to other mentioned countries, this is extremely low. Croatia has only 1.0% people with only primary education; Post secondary non tertiary education is 0.0%; High education is much lower than the average, only 16,3%; and the most expressed is the lower and upper secondary education with 52,6%.

However, these data do not show the exact situation, primarily because the National Classification of Education⁴⁹ does not correspond to the International Standard Classification of Education ISCED⁵⁰, and the reality is a bit different. In Table 4. it is attempted to present the Croatian education system through the international standards by using educational years for each degree of student's age, and then it is compared to the EU average.

A person has no formal education as long as he does not finish primary school, which means that Croatia has more than 9.6% such as labour. Through the ISCED that refers to: no formal education, primary, a part of lower secondary, but in Croatian education system this is still with no vocation! That means, with no vocation is 30.9% of Croatian population. With finished primary education, Croatia has 21.3%, which is a part of lower secondary education through the ISCED. Croatian high school corresponds to upper secondary education through ISCED, and its share is 52.6%. Croatian higher education can correspond to post secondary, not tertiary through ISCED, whose share is 5.8%, but not specified through ISCED while it is counted in high education. The share of high education is only 10.5% that match to first and second stage of tertiary education through ISCED. Data includes only 0.3% Ph.D.

A simple conclusion can be made on the basis of presented data in that way, which is that there are triple more people with no education or with only elementary than those with tertiary education. Only for comparison, ET 2020⁵¹ states that the share of tertiary education in the population between 25 and 65 ages should be greater than 40%. Croatia is yet not even close.

⁴⁸ It is given the review for only 23 EU countries, because for the other 4 the data were not available. The European Statistical System (ESS) <http://ec.europa.eu/eurostat/web/european-statistical-system>

⁴⁹ Croatian Bureau of Statistic Yearbook 2005 http://www.dzs.hr/Hrv_Eng/ljetopis/2005/26-met.pdf

⁵⁰ The Structure of the European Education Systems 2014/15: Schematic Diagrams, European Commission http://eacea.ec.europa.eu/education/eurydice/documents/facts_and_figures/education_structures_EN.pdf

⁵¹ Council conclusions of 12 May 2009 on A Strategic Framework for European Cooperation in Education and Training (ET 2020) (2009/C 119/02) [http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52009XC0528\(01\)&from=EN](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52009XC0528(01)&from=EN)

Table 4.: Education structure of the EU population through the Population census 2011³ in compare to Croatian education system through data of Population census 2011

Through ISCED	No formal educa- tion	Pri- mary educa- tion	Lower sec- ondary		Upper sec- ondary educa- tion	Post sec- ondary non tertiary educa- tion	First and second stage of tertiary educa- tion	Not stated
EU average	3.2	12.5	24.1		35.9	1.9	21.4	1.0
Croatia	1.7	1.0	28.2		52.6	0.0	16.3	0.2
Through National Classifi- cation of Education	No formal educa- tion	To 3 grade of el- emen- tary educa- tion	From 4 to 7 grade of el- emen- tary educa- tion	Fin- ished el- emen- tary educa- tion	Fin- ished high school	Higher educa- tion	High educa- tion	Not stated
Croatia	1.7	1.0	6.9	21.3	52.6	5.8	10.5	0.2
Croatia		30.9			52.6	5.8	10.5	0.2

Source: Authors through data from European Statistical System 2011 (ESS), Croatian Population Census 2011 and International Standard Classification of Education ISCED 2011

According to Sundać and Krmpotić's (2009) research, Croatia is at the bottom of the observed countries according to participating in the system of lifelong learning. Only 2.2% of the population aged between 25 and 64 participate in some form of lifelong learning, and in comparison to the EU average of 9.5%, or Finland 33%, it is very low (Čučković and Bartlett, 2012). Babić (2005) believes that adult education in Croatia is "the most neglected and under-developed part of the education system"⁵². Lowther (2004) and Šošić (2004) also consider the rate of participation in lifelong learning in Croatia as very low. Šošić (2004) points out that the under-development of the lifelong learning system in Croatia is particularly evident among the population older than 34 ages. Noting the problem of very low lifelong learning level in Croatia, Babić (2005), states that Croatian companies take a very little part in the financing of additional forms of education and training of its employees. Only for comparison, ET 2020 states that the share of adults participating in lifelong learning should be at least 15%.

At a very poor level is Croatia according to the average number of students per 1.000 inhabitants for the period from 2002 to 2005 because there are only 27 of them, stated Sundać and Krmpotić (2009) in comparison to Austria that has 93. Šošić (2004) specifies that during the '90s the number of students has increased

⁵² Babić, Z., "Participacija i ulaganje u obrazovanje u Hrvatskoj." Privredna kretanja i ekonomska politika 14.101: (2005), p. 45

about 30%, and the reason for such a large increase he finds in the problem of employing people with low skills, but also because of higher rate of return on investment in education. Babić, Matković and Šošić (2006) show an increase of 60% of students in 2005 in comparison to 1995.

Sundać and Krmpotić (2009) stated that Croatia is at the bottom of the observed countries in according to the following indicators: average number of employees in the period from 2002 to 2006; numbers of employee in jobs that create knowledge or knowledge-intensive sectors of high technology research and development; numbers of researchers employed in research and development per million inhabitants. Croatia has only 3.91% of employees in jobs that create knowledge, in comparison to the average of the EU, which has 5.68% or Germany with 9.15% employees in that area. In 2006, Croatia had only 1.148 researchers, in comparison to Germany and Austria with more than 3.000 or Sweden over 6.000.

As an indicator of the use of technology, Lowther (2004) takes the number of personal computers per 1000 population, and emphasizes that this indicator suggests a significant lagging behind developed countries. Through the Population Census 2011 from the total number of households, only 55% of them have a computer. Lowther (2004) believes that the adult literacy rate is quite satisfactory, and through the Population Census 2011 the illiterate rate is only 0.8%.

While researching skills that Croatian employees have, Lowther (2004) came to the conclusion that the education system allows the creation of knowledge that Croatian employers need, but there is a discrepancy between the technical employee's skills and those skills required for the specific job, which leads to a conclusion for better relation between the education an lifelong learning system with the labour market needs. Primary and secondary education, because of focusing in factual knowledge and passive learning, do not provide the acquisition of skills for the current labour market needs. Vocational high schools provide the acquisition of skills and expertise in a narrow profession area and some of professions, due to technological development, are not suitable for the current labour market needs. University programs are not sufficiently compatible with current labour market needs. Vokić and Frajlić (2004) conclude that Croatian employees are not competitive. Croatian employees are mostly older, with an average of 38 years; the average ratio of men and women is 3: 1; the average degree is slightly higher than high school; according mobility and changing jobs, Croatian workers are immobile, and the most mobile companies are foreign-owned; Croatian employees do not have a high rate of absenteeism. Subjective opinion of managers on the competitiveness of its employees was very highly rated, with mark "very good". Based on the research conducted by The Economic Institute in 2014⁵³, Croatian companies consider the current education system is not providing adequate employee

53 AniĆ, I.D., at al., "Kako pobuditi rast Hrvatskog gospodarstva", Ekonomski institut, Zagreb, (2014)

skills which respond to current market needs, such as lack of practice in activities performing, lack of work habits.

Analyzing cost and benefits of education empirical research in Croatia, Šošić (2004) came to the conclusion that the rate of return on an additional year of education in 2002 was 10.5%. Barić (2003), analyzing the investment decision-making in education, considers an individual decision for investing in education when it is profitable for him, which means when the net present value of benefits and costs are greater or equal to zero, or when the investments provide higher or the same return as that the investments in bank or in some other projects.

6.3. QUALITATIVE INDICATORS

Croatia was not involved in any international student's achievements test, and that is the reason those indicators were not involved in the previous researches. Croatia involved for the first time in PISA survey in 2006. There were a total of 65 countries that participated, and last processed data are those from 2012. During 2015, another test was conducted, and the results will be published late in 2016⁵⁴. In 2011, Croatia was involved for the first time in both IEA projects: TIMSS and PIRLS, conducted by NCVVO⁵⁵. The rankings of Croatian students' international achievements taking parts in international testing: PISA, TIMSS, and PIRLS are listed below.

In the PISA study from 2012, except testing student's cognitive achievements, there was a survey for students, their parents, and school leaders, in order to determine the potential impact on student achievement. In the field of mathematics, Croatia is ranked 40th. Almost 30% of students do not have basic knowledge and skills needed to perform tasks in mathematics in different areas of life, and the highest level was reached only by 1.6% of Croatian students. Somewhat better has Croatia been ranked in the field of science; 34th, and in reading at the 35th place. Basic knowledge or skills, in the field of science are not owned by 17.2% of students and 18.6% in the field of reading. The highest level in the field of science and reading reached about 4% of the students. The achievements of Croatian students in all three areas are lower than the OECD average.⁵⁶

If we consider the ET2020, which gives guidance till 2020 about the proportion of those students who do not meet even the lowest level of basic skills, which should be less than 15%, it can be concluded that, for now, the quality of the Croatian education system is not sufficient.

According to the results achieved in TIMSS research in the field of mathematics, Croatia is ranked 30th and the achievements of science in the 23rd place, out of

54 <http://pisa.hr/novosti/pisa-2015-glavno-istraživanje/>

55 National Center for the Evaluation of Education <https://www.ncvvo.hr/>

56 <https://www.ncvvo.hr/wp-content/uploads/2015/12/Priop%C4%87enje-za-javnost.pdf>

50 participating countries.⁵⁷ Among the results achieved in PIRLS research in the field of reading, compared with the other 56 countries participating in the survey, Croatia is ranked 8th and it is ranked among the countries with excellent results. These results are comparable with those achieved by students from the USA, Ireland, or England.⁵⁸

Pastuović (2009) commented the results of the first participation of Croatian students on international tests PISA 2006 and he considered the achievement to be very poor because they were classified in an "under average" group of countries. However, he wonders, how accurately were those achievements evaluated? He also considered that it would be best to compare those achievements with other transition countries, where the achievements of Croatia are classified in the middle, and especially for that, one should have reasons for dissatisfaction.

Čučković and Bartlett (2012) analyze the PISA 2009 results and find out some worsening of the scores especially in the field of mathematics and science, which leads them to a conclusion that Croatia needs further advancement and improvement in order to have a competitive human capital.

Pastuović (2012) thinks there is a necessity for additional analysis of factors that have contributed to these poor results, so that could introduce educational system changes. He emphasizes that, in addition to the national average, more additional information on the efficiency or inefficiency of the education system are needed, such as indicators of school average and comparison with the national average, and the impact of socioeconomic factors on the students' success all in order to gain access to establishment of measures for improving the education system.

7. CONCLUSION

Croatia aspires to a knowledge society. Knowledge society is based on knowledge, which Croatia obviously has not got enough for making a great impact on improving the quality of human capital. According to the data presented in this paper, Croatian educational structure is not satisfying, the results on international student's achievements tests are not satisfying, and investment in education is insufficient. Looking at Table1, only two indicators which are considered to be satisfied (marked with *) can be noticed; such as the literacy rate (Lowther, 2004) and government expenditure in education, but only through Šošić (2004) explained. Other indicators point to below average rate, suggesting that the level of human capital in Croatia is low, and its quality is poor.

Authors indicated numerous problems, as well as gave suggestions how to increase the human capital quality, and therefore below their views and conclusions are specified.

57 http://dokumenti.ncvvo.hr/TIMSS/Dokumenti/TIMSS_2011_izvjesce.pdf

58 http://dokumenti.ncvvo.hr/PIRLS/Dokumenti/PIRLS_2011_izvjesce.pdf

The Croatian educational structure is very bad, with strong low share of highly educated population that should be the leading change holder to the knowledge economy. The number of students is very small, and those with large years of study duration and high study dropout rate. Šošić (2004) believes that the long-study can be linked to difficulties in the labour market, and believes that this problem could be solved by introducing higher tuition fees. He emphasizes that such a system would be even fairer, especially concerned to taxpayers, and this because, now they are currently financing students who are going to have higher income than the average, but a third of these students is financed for nothing, because every third study is completed unsuccessfully. Pastuović (2012) refers to the damage caused by premature abandonment of formal education such as the subsequent payment of additional training, criminal behaviour caused by social exclusion, loss of revenue in the state budget because of accumulating people who do not work, the increase of underground economy.

The incompatibility of educational programs with the current labour market needs is emphasized. Lowther (2004) states that the education system needs to change from a supply-driven system to a demand-driven, which means that the education system should be able to afford various educational opportunities for all. Babić (2005), as a big problem in the secondary education system sees the mismatch of curriculum and professions and the current needs of the labour market, adding that a large number of students enrolled in those programs and occupations in which the unemployment rate is just about the greatest. Bejaković (2004) explains how the educational programs are mainly focused on memorizing basic knowledge, rather than focusing on independent analysis and conclusion. He believes that higher primary school education programs are designed more for enrolling into gymnasium, but not for vocational programs. Also, he believes that there is a need to apply a special system of dealing with gifted students. He recommends increasing the internal differentiation of students. As the main problem of primary and secondary education, he considers the insufficiency in differentiation and dropout rates.

In addition to compliance with the current labour market needs, Lowther (2004) emphasizes the need to involve citizens in the education system in the beginning of early childhood, and the need to raise their awareness about the importance of continuous improving in knowledge and skills.

The importance of recognizing education as a factor that enables citizens a better life quality, and recognition of the value of lifelong learning which is necessary to create a flexible workforce to changes in the labour market, are indicated by Sundać and Krmpotić (2009). Bejaković (2004) considers that the share of highly educated is not so far behind the developed countries, but that the level of competitiveness of the Croatian labour force is still at a low level, which he links with the mismatch of study programs and the needs of contemporary trends in the labour market.

Nikolić (2007) emphasises the need for decentralization of the education system management as well as the decentralization of the system of financing educa-

tion, which can lead to a higher quality education system, better central control over managing and financing, and therefore the higher level of human capital quality. Bejaković (2004) pointed out the need to improve the institutional framework relating to the weak effects of institutions, prevention of illegal behaviour, and increasing public confidence in the system.

The fact that, there is the necessity for reform in the education system; is clear from all indicators. Lowther (2004) believes that a big role in improving the quality of formal education has a Ministry of education through making better relations with schools, universities, and professors to develop a strategy for conducting the reform of the education system. Pasuhović (2009) considers that the objective indicators, such as the results of the international achievement tests, as well as data collected in the test, can assist in the creation of educational policy.

Unfortunately, it is not enough to invest in education for creating an acceptable level of human capital with adequate quality. It would be too simple. It is necessary to change the education system in general, but also to recognize the importance of education as a factor that can lead Croatia into a knowledge society.

REFERENCES

- Anić, I.D., at al., "Kako pobuditi rast Hrvatskog gospodarstva", Ekonomski institut, Zagreb, (2014)
- Altinok, N., and Murseli, H., "International database on human capital quality." *Economics Letters* 96.2. Elsevier, (2007): 237-244
- Andriessen, D. Stam, C., "Intellectual capital of the European Union." *McOaster World Congress on the Management of Intellectual Capital and Innovation*. Hamilton, Ontario, Canada, (2005)
- Babić, Z., "Participacija i ulaganje u obrazovanje u Hrvatskoj." *Privredna kretanja i ekonomska politika* 14.101, (2005): 28-53
- Babić, Z., Matković, T., and Šošić, V., "Strukturne promjene visokog obrazovanja i ishodi na tržištu rada." *Economic Trends & Economic Policy* 16.108, (2006)
- Barić, Vinko. "Temeljne odrednice investiranja u obrazovanje odraslih." *Pomorski zbornik* 41.1, (2003): 361-379
- Becker, G.S., "Human capital: A theoretical and empirical analysis, with special reference to education", 3rd Edition, University of Chicago Press, (1993)
- Bejaković, P., "Konkurentnost hrvatske radne snage" Institut za javne financije, Zagreb, (2004)
- Boarini, R., D'Ercole, M.M., and Liu, G., "Approaches to Measuring the Stock of Human Capital: A Review of Country Practices", *OECD Statistics Working Papers*, No. 2012/04, OECD Publishing, Paris, (2012)
- Bogdanović, M., "Prilog teoriji ljudskog kapitala: Koja svojstva radne snage treba smatrati bitnim sastavnicama ljudskog kapitala", *Ekonomija / Economics* 15.1, (2008): 45-81
- Bontis, N., "National intellectual capital index: the benchmarking of Arab countries" *Journal of Intellectual Capital* 5.1: 13-39, (2004)
- Council conclusions of 12 May 2009 on A Strategic Framework for European Cooperation in Education and Training (ET 2020) (2009/C 119/02) [http://eur-lex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:52009XG0528\(01\)&from=EN](http://eur-lex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:52009XG0528(01)&from=EN)
- Croatian Bureau of Statistic: 1) Yearbook 2005 http://www.dzs.hr/Hrv_Eng/ljetopis/2005/26-met.pdf 2) Population Census 2011 http://www.dzs.hr/Hrv/censuses/census2011/results/htm/h01_01_36/h01_01_36_RH.html
- Čučković, N. and Bartlett, W., "Skills Matching in Croatian SME sector and competence based education and training: progress and prospects." *Labour Market and Skills in the Western Balkans*, FREN Belgrade and LSE London, (2012): 155-175
- European Statistical System (ESS) <http://ec.europa.eu/eurostat/web/european-statistical-system>
- Eurostat Regional Yearbook 2014 <http://ec.europa.eu/eurostat/documents/3217494/5786237/KS-HA-14-001-03-EN.PDF/43efce65-4b6c-4105-8c93-a6fce178c5ee?version=1.0>
- Filipić, P., "Makroekonomija gubljenja statusa redovitog studenta ili fiskalne posljedice (ne) položenog ispita." *Financijska teorija i praksa* 33.1, (2009): 1-23
- Hanushek, E.A. and Kimko, D.D., "Schooling, Labor-Force Quality, and the Growth of Nations", *American Economic Review*, 90(5), (2000): 1184-1208
- Horvat Novak, D., and Hunjet, A., "Analiza učinkovitosti visokog obrazovanja u Republici Hrvatskoj." *Tehnički glasnik* 9.4, (2015): 461-468

Human development Report 2015 Team, Work for Human Development, United Nations Development Programme (UNDP), New York http://hdr.undp.org/sites/default/files/2015_human_development_report.pdf<http://hdr.undp.org/en/countries>

International Association for the Evaluation of Educational Achievement www.iea.nl <http://timssandpirls.bc.edu/> http://timss.bc.edu/timss2011/downloads/T11_IR_Mathematics_FullBook.pdf http://timss.bc.edu/pirls2011/downloads/P11_UserGuide.pdf

International Labour Organization http://www.ilo.org/global/publications/books/forthcoming-publications/WCMS_409035/lang--en/index.htm

Kiss, I., "Financiranje obrazovanja u Europi i u Republici Hrvatskoj." *EKONOMIJA / ECONOMICS* 1/IX, (2002) www.rifin.com

Kwon, Dae-Bong, "Human capital and its measurement." *Proc. The 3rd OECD World Forum on Statistics, Knowledge, and Policy*, (2009)

Lee, J. W. and Barro, R. J., "Schooling Quality in a Cross Section of Countries", *Economica*, 38(272), 465-488, Wiley Online Library, (2001)

Lowther, J., "Kvaliteta hrvatskoga formalnog obrazovnog sustava." *Deloitte Touch Tohmats*, Washington, (2004), <http://www.ijf.hr/konkurentnost/lowther.pdf>

Mankiw, N. G., "Principles of economics", Mason, Ohio: Thomson/South-Western, (2004)

Miller, R., "Measuring What People Know: Human Capital Accounting for the Knowledge Economy", Paris: OECD Publishing, (1996)

National Center for the Evaluation of Education <https://www.ncvvo.hr/> <https://www.ncvvo.hr/wp-content/uploads/2015/12/Priop%C4%087enje-za-javnost.pdf> http://dokumenti.ncvvo.hr/TIMSS/Dokumenti/TIMSS_2011_izvjesce.pdf http://dokumenti.ncvvo.hr/PIRLS/Dokumenti/PIRLS_2011_izvjesce.pdf

Nikolić, N., "Financijska decentralizacija obrazovnog sustava u Hrvatskoj." *Ekonomski misao i praksa* 2, (2007): 213-228

OECD, Education at a Glance 2014 <http://www.oecd.org/edu/Education-at-a-Glance-2014.pdf>, Education at a Glance 2013 [https://www.oecd.org/edu/eag2013%20\(eng\)-FINAL%2020%20June%202013.pdf](https://www.oecd.org/edu/eag2013%20(eng)-FINAL%2020%20June%202013.pdf)

Pasher, E., and Shachar, S., "The intellectual capital of the state of Israel: 60 years of achievement." *Prieiga per internetį*: <http://www.moital.gov.il/ic>, (2007)

Pastuović, N., "Edukologija: integrativna znanost o sustavu cjeloživotnog obrazovanja i odgoja", *Znamen*, Zagreb, (1999)

Pastuović, N., "Obrazovanje za razvoj: Kako obrazovanje razvija ljude i mijenja društvo, a kako društvo djeluje na obrazovanje", Zagreb: Institut za društvena istraživanja u Zagrebu: Učiteljski fakultet Sveučilišta u Zagrebu, (2012)

Programme for International Student Assessment PISA www.pisa.hr <http://pisa.hr/novosti/pisa-2015-glavno-istrazivanje/>

Pološki, V., N., and Grizelj, H., "Obrazovanje i razvoj zaposlenika u hrvatskim organizacijama." *Ekonomski pregled* 58.12, (2007): 851-880

Požega, Ž. and Crnković, B., "Stope povrata od ulaganja u ljudski i fizički kapital." *Ekonomski Vjesnik/ Econviews: Review of contemporary business, entrepreneurship, and economic issues* 21.1-2, (2008): 67-73

- Raguž, I., Družić, I., and Tica, J., "Impact of the transition on the TFP in Croatia." *EFZG Working Paper Series/EFZG Serija članaka u nastajanju* 05, (2012): 1-26
- Schultz, Theodore W., "Investment in human capital", *The American Economic Review* 51.1, (1961): 1-17
- Schultz, Theodore W., "Investing in people: The economics of population quality", University of California Press, (1982)
- Stengos, T., and Savvides, A., "Human capital and economic growth", Stanford University Press, Stanford, (2009)
- Structure of the European Education Systems 2014/15: Schematic Diagrams, European Commission, http://eacea.ec.europa.eu/education/eurydice/documents/facts_and_figures/education_structures_EN.pdf
- Sundać, D., and Krmpotić, Fatur I., "Vrijednost ljudskog kapitala u Hrvatskoj - usporedba s odabranim europskim zemljama." *Ekonomski pregled* 60.7-8, (2009): 315-331
- Šćukanec, N., Sinković, M., Bilić, R., Doolan, K. i Cvitan, M. "Socijalni i ekonomski uvjeti studentskog života u Hrvatskoj: nacionalno izvješće istraživanja EUROSTUDENT V za Hrvatsku za 2014.", Zagreb: Ministarstvo znanosti, obrazovanja i sporta, (2015)
- Škare, M., "Human Capital as a Source of Growth-Myth or Reality?." *Ekonomski pregled* 52.1-2, (2001): 189-205
- Škare, M., Kostelić, K., Justić Jožićić, K., "Does Higher Education Pay off? - Micro an Macroeconomic Policy Implications"; *The future of economics: Between rules and discretion*; Juraj Dobrila University of Pula, (2013): 93 - 120
- Šošić, V., "Isplati li se u Hrvatskoj ulagati u obrazovanje: povrat ulaganja u ljudski kapital kao čimbenik konkurentnosti ljudskih resursa ", Institut za javne financije, (2004) <http://www.ijf.hr/konkurentnost/sosic.pdf>
- Tica, J. and Đukec, D., "Doprinos ljudskog kapitala ekonomskom rastu u Hrvatskoj." *Zbornik Ekonomskog fakulteta u Zagrebu*, 6.1, (2008): 289-301
- Tica, J., and Grgurev, I., "Relativna važnost faktora rasta u Republici Hrvatskoj." *EFZG Working Paper Series/EFZG Serija članaka u nastajanju* 02, (2014): 1-16
- UNESCO Institute for Statistic <http://data.uis.unesco.org/?querid=181>
- UNICEF, <http://www.transmonnee.org/databases.php> TransMonEE 2015 Database, Country profiles 2015
- Vokić, P., N., and Frajlić, D., "Pokazatelji konkurentnosti hrvatske radne snage: rezultati empirijskog istraživanja, iz Bejaković." P., Lowther, J. ur.: Konkurentnost hrvatske radne snage, Institut za javne financije, Zagreb, (2004): 59-74
- Wu, M., "Comparing the Similarities and Differences of PISA 2003 and TIMSS. *OECD Education Working Papers*, No. 32." OECD Publishing (NJ1), (2010), [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?doclanguage=en&cote=edu/wkp\(2010\)5](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?doclanguage=en&cote=edu/wkp(2010)5)

REVEALED COMPARATIVE ADVANTAGE INDEX: AN ANALYSIS OF EXPORT TRADE IN THE AUSTRIAN DISTRICT OF BURGENLAND

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ABSTRACT

The Austrian District of Burgenland is located in the eastern part of the country. In the last decade, the region has benefited from different subsidy programs from the European Union. The aim of this paper is to analyze and evaluate the export competitiveness of Burgenland in relation to the foreign trade of Austria as a whole from 2010 to 2014, which is the period showing the highest increase in exports since the Iron Curtain fell. The Revealed Comparative Advantage index (RCA) was used to determine the development of the region's exports. The RCA index is used in international economics for calculating the relative advantage or disadvantage of a certain country in a certain class of goods or services. The findings show that Burgenland has important exports of agricultural products and that economic relationships with neighbouring countries are deepening. This study is an important contribution towards demonstrating the development of former Objective 1 area countries in the European Union.

Keywords:

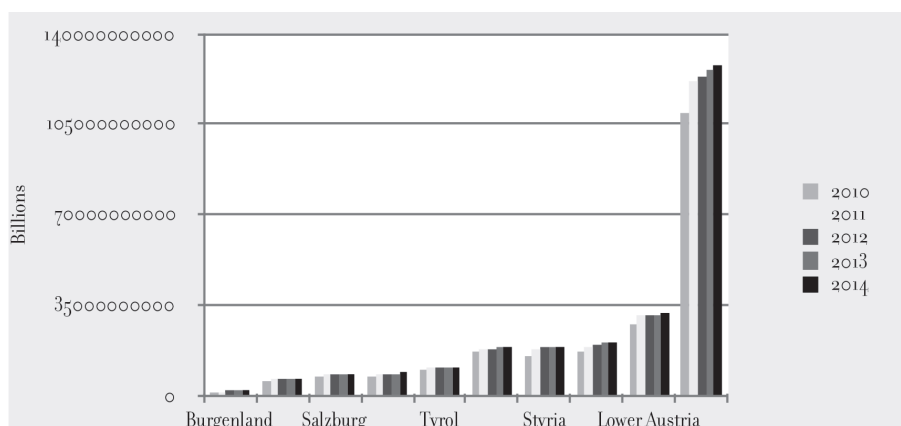
Export competitiveness, Burgenland, Revealed comparative advantage

I. INTRODUCTION

The aim of this paper is to analyze and evaluate the export competitiveness of Burgenland compared to the foreign trade of Austria as a whole from 2010 to 2014. This period was chosen because exports showed record increases over this time compared to any other period since the Iron Curtain fell. The final year of data used was 2014 because the data for 2015 were not available at the start of the study. The chosen metric for the analysis is the Revealed Comparative Advantage (RCA), derived for 97 product categories and 20 countries.

Burgenland is located in the eastern part of Austria. In the last decade, the region has benefited from different subsidy programs from the European Union proclaims the Regional management Burgenland on his website (As of June 12, 2016, <http://www.phasing-out.at>)¹. Although this has contributed to increasing exports from the district, Burgenland still has the smallest export share of all Austrian districts (Figure 1.). In general, foreign trade has risen from 2010 to 2014 in all districts.

Figure 1.: Export rates of Austria and its districts



Source: WKO Statistics

Relation Value Exports from 2010 - 2014

Historically, the region is characterized by agriculture, although the area of land in agricultural use has declined slightly through recent decades. In 1990 there were 325,000 ha of agricultural land, 8.8 percent more than today.² According to Statistik Austria, in 2010 there were 288,000 ha of agricultural land, a historical low. Four years later the agricultural area was 299,000 ha, an increase of 3.9 percent.³

¹ Granabetter, "Export between the Poles Globalisation and Regionalisation-using the Case of the Austrian District Burgenland", 1-2.

² "Der grüne Bericht 2009", Amt der burgenländischen Landesregierung, 11.

³ "Statistik der Landwirtschaft", Statistik Austria, 94.

Goods "Made in Burgenland" are enjoying increasing popularity abroad, including agricultural products. In 2010, Burgenland reported exports amounting to 1.5 billion euros and by 2014 this had risen to 2 billion euros, an increase of one third⁴. Nearly 5 percent of the 17,000 companies of the region are engaged in exports, which is considerably below the Austrian average of 10 percent of entrepreneurs engaged in operations abroad⁵.

Exports by manufacturing companies of the regional economy (without merchandise sales) rose to a record level in 2014 of around 1.3 billion euros. But in comparison with other districts the export ratio of 35.8 percent is the weakest of all Austrian provinces.

In Burgenland the major share of exports comes from industry (1 billion euros). The businesses of this division have increased their export volume again after a slump in 2009.

Table 1.: Exports from Burgenland, showing the value of the top 10 ranking product groups

Product group	2010	2011	2012	2013	2014
Electronics	508.0	352.2	529.8	516.0	577.6
Plastics	126.5	184.2	187.1	183.0	152.8
Machinery, technical equipment	78.5	134.6	130.5	130.6	131.6
Synthetic fibres	76.6	3.9	4.4	106.7	106.2
Cereals	30.2	33.7	36.2	83.0	80.2
Waste from the food industry	51.1	22.2	25.2	66.1	74.2
Automobiles and parts thereof	64.7	77.2	92.5	70.5	74.0
Wood and wood products	60.1	53.8	54.8	53.2	55.4
Books and newspapers	73.6	50.9	55.2	64.2	51.1
Clothing	40.9	187.2	186.2	58.2	50.7

Source: Statistik Austria, figures in million Euros

The most important product groups for export are electronics, plastics, machinery and technical equipment (Table 1.). In 2014, cereals, waste from the food industry and wood products, all of which are attributable in a broader sense to agriculture, were ranked fifth, sixth and eighth in the top 10 respectively. The largest increase in the period from 2010 to 2014, was shown by the product group cereals with an increase of 165.35 per cent.

In the manufacturing sector of crafts and trades, butchers together with the food and beverage industry have the highest export ratios (34.3 percent). Overall the exports from this division are worth 103 million euros annually.

4 "Exporte und Importe burgenländischer Unternehmen", Wirtschaftskammer Burgenland.

5 Anzinger and Müllner-Stefenelli, "Analyse des Wiener Außenhandels".

Table 2.: The top 20 export destinations OF Burgenland's economy by value

Export country	2010	2011	2012	2013	2014
Belgium	19.2	16.9	16.9	16.9	19.5
China	48.1	63.4	63.6	59.5	68.7
Croatia	9.5	8.3	7.0	9.0	13.2
Czech Republic	40.2	41.1	43.9	44.7	42.3
France	61.0	59.8	68.7	64.0	58.9
Germany	553.8	599.0	626.4	610.6	573.5
Great Britain	59.4	59.6	60.5	64.8	67.3
Hungary	124.4	175.7	188.4	241.6	297.0
Italy	78.3	74.9	77.2	90.6	89.2
Netherlands	42.8	38.0	36.9	32.8	28.9
Poland	54.2	49.2	44.5	56.0	54.4
Romania	54.0	32.9	27.2	28.8	38.3
Russia	23.3	21.7	33.2	55.5	42.4
Slovakia	23.5	30.3	31.0	37.5	37.4
Slovenia	34.6	38.8	47.4	61.4	64.4
Spain	23.3	35.4	35.1	42.5	44.5
Sweden	16.1	17.6	23.8	30.8	45.1
Switzerland	33.6	40.4	45.9	75.1	70.5
Turkey	27.5	29.9	26.1	25.1	24.9
United States	27.4	34.4	55.1	57.8	52.2

Source: Statistik Austria, figures in million Euros, not rounded

In 2014, the most important export destinations for Burgenland's economy were Germany, Hungary, Italy, Switzerland and China (Table 2).

- What does this mean in comparison to Austrian Exports in general?
- What groups benefit from an advantage and to what extent?
- Which sectors are declining? Which are booming?
- Which countries are promising markets for Burgenland's economy?

According to the United Nations Conference on Trade and Development (UNCTAD) and the World Trade Organization (WTO), world merchandise exports rose moderately by 0.6 percent in 2014, reaching 19 trillion US Dollars⁶.

Austria's merchandise exports increased from 152,560 million US dollars in the year 2010 to 178,248 million in 2014, while services exports rose from 52,739 million US dollars in the year 2010 to 67,311 million in 2014.⁷

⁶ UNCTAD, "In 2014, world merchandise exports grew by 0.6 percent, while trade in services recorded a 4.2 percent global increase".

⁷ UNCTADSTAT, General Profile: Austria, General Information for 2014. <http://unctadstat.unctad.org/CountryProfile/GeneralProfile/en-GB/040/index.html>.

Although Austrian exports increased in absolute numbers from 2010 to 2014, its market share in world exports decreased by 15.72 percent over the five year period.⁸

The objectives of this paper are to analyze the importance of Burgenland's merchandise exports in comparison to Austrian merchandise exports.

In the next section the theory around export performance research is outlined, with particular focus on the RCA index. The methodology used and the hypotheses tested are introduced in section three. The results section shows the calculated figures for countries with an RCA index higher than 1, the ranking of the top 20 export product groups and the classes with the largest growth and the strongest decline.

2. THEORETICAL FRAMEWORK AND REVIEW OF SELECTED LITERATURE

Export performance research has proliferated in recent decades. The field of inquiry is characterized by a diversity of conceptual, methodological, and empirical approaches that inhibit the development of clear conclusions regarding the determinants of export performance.⁹

In the development and evolution of international trade theory, comparative advantage has always been a core concept. Since Ricardo's (1817) classic model of comparative advantage (CA) in trade was put forward, the theory of comparative advantage has been gathered to form a theory system. An approach of comparative advantage calculation through almost two centuries' development. The most widely used application has been proposed after the Revealed Comparative Advantage (RCA) and its modification put forward by Balassa (1965).¹⁰

Comparative advantage analysis is a useful tool in economics that can be used to compare the relative costs of production and identify sectors and markets that have the greatest likelihood of success. Balassa Index is widely used in the field to measure country-sector Revealed Comparative Advantage.

Examples publishes in the last year are the "*Empirical Analysis of Agricultural Exports Competitive of Henan Province*" (*Proceedings of 2015 2nd International Conference on Industrial Economics System and Industrial Security Engineering*, 187-193, December 2015), "Determinants of revealed comparative advantages: The case of cheese trade in the European Union" (published in *Acta Alimentaria-An International Journal of Food Science* by Jeremias Balogh and Attila Jámbor) or the publication "Uganda's Revealed Comparative Advantage in COMESA" by Miriam Katunze and Annette Ku-teesa.

8 Republik Österreich Parlament, Warnmechanismusbericht 2016, 4.

9 Shaoming and Stan, "The determinants of export performance: a review of the empirical literature between 1987 and 1997", 333 - 356.

10 Jia, Wu and Liu. "The Evolution of Measurement Methods of Comparative Advantage and New Trends in Intra-Product International Specialization", 82.

Two different approaches are normally used to assess comparative advantage: the Domestic Resource Cost (DRC) and the Revealed Comparative Advantage (RCA) methods.¹¹

In comparison to RCA the DRC index has a big disadvantage. The DRC approach requires data on production costs which may be hard to obtain. In contrast, the data required for the calculation of the RCA index are normally available in publicly available statistics. Another potential advantage of this method is that it is more descriptive, but it does have less predictive potential than the DRC approach.

Another variation of the RCA index is the model suggested by Donges and Riedel¹² where both export and import is included. The RCA index suggested by Bowen¹³ considers the production of a particular country and net trade (i.e. production minus consumption). The RCA indices suggested by Vollrath¹⁴ measure exports and imports in relation to the rest of the world¹⁵.

On the other hand Leromain and Orefice criticize this method because it mixes up all the factors influencing trade flows.¹⁶

3. METHODOLOGY

The RCA index was used to determine the most important destinations and product groups for the region's export trade. It is used in international economics to calculate the relative advantage or disadvantage of a certain country in a certain class of goods or services.

The study used data for 99 product groups and 197 countries which are compiled by Statistik Austria and the Economic Chamber of Austria. To improve the readability of the paper the focus is on the top 20 product groups and countries with an RCA index above 1. Data for the period 2010 to 2014 were used because the increase in Burgenland's exports over this time was the highest since the fall of the Iron Curtain. The relevant figures for 2015 were not available at the time of the analysis and are not reported here.

11 Hishamunda, Junning and PingSung. "Assessment of comparative advantage in aquaculture: framework and application on selected species in developing countries".

12 Donges and Riedel. "The expansion of manufactured exports in developing countries: An empirical assessment of supply and demand issues", 58-87.

13 Bowen. "On the theoretical interpretation of indices of trade intensity and revealed comparative advantage", 464-472.

14 Vollrath. "A theoretical evaluation of alternative trade intensity measures of revealed comparative advantage." 265-280.

15 Hishamunda, Junning and PingSung. Assessment of comparative advantage in aquaculture: framework and application on selected species in developing countries, 69.

16 Leromain and Orefice, "New Revealed Comparative Advantage Index: Dataset and Empirical Distribution," 50.

Usually, the index is used to give results for a specific country. This paper applies it to a district and analyzes the exports of that part of the country as compared with the state's exports in general. The idea is to consider the relationship between changes in the export destinations and product categories of a district to those of the next largest geographical unit, the nation.

RCA most commonly refers to an index introduced by Béla Balassa (1965)¹⁷.

$$RCA = (E_{ij} / E_{it}) / (E_{nj} / E_{nt})$$

where E is exports, _i is the country index, _n is the set of countries, _j is the commodity index and _t is the set of commodities.

That is, the RCA is equal to the proportion of the country's exports that are of the class under consideration (E_{ij} / E_{it}) divided by the proportion of world exports that are of that class (E_{nj} / E_{nt}). In this study the figures for a federal province in Austria, i.e. Burgenland, were compared with Austria's exports as a whole in order to assess the development of Burgenland's exports relative to Austrian market share.

A comparative advantage is "revealed" if $RCA > 1$. If RCA is less than unity, the country is said to have a comparative disadvantage in the commodity or industry.

The RCA index is used to analyse different sectors, particularly in agriculture, e.g. Aquaculture¹⁸ and countries, e.g. China, India¹⁹ and Turkey²⁰. The weighting of exports from different product groups like agricultural products are examined with respect to the economies of the relevant export destinations. For a secondary data analysis, the company database of the Burgenland Economic Chamber is used.

The following hypotheses were tested:

H 1: Economic relations with neighboring countries, in particular Hungary, have continued to develop more than 10 years after the fall of the iron curtain.

H 2: The share of agricultural products in export has declined in Burgenland compared to Austria as a whole in favor of technological products.

4. STUDY RESULTS

The calculations of the RCA index were carried out by product group and country. Considering the export destinations, it is particularly striking that Hungary is an important business partner.

This is perhaps unsurprising considering its geographical location - Burgenland shares a border with Hungary (Table 3.).

H 1: Economic relations with neighboring countries, in particular Hungary,

17 Balassa, Trade Liberalisation and Revealed Comparative Advantage, 99-123.

18 Hishamunda, JunNing and PingSung, Assessment of comparative advantage in aquaculture: framework and application on selected species in developing countries, 528.

19 Batra and Khan. Revealed Comparative Advantage: An Analysis for India and China, 5.

20 Serin and Abdulkadir. Revealed Comparative Advantage and Competitiveness: A Case Study for Turkey towards the EU, 25-41.

have continued to develop more than 10 years after the fall of the iron curtain. The hypothesis is thus confirmed.

The relatively high value of exports to Sweden is remarkable. This highlights the importance of comparing the RCA values with the business directory of the Economic Chamber. The particularly high value for Burgenland concerning Sweden can probably be associated with a parent company in this country.

Table 3.: RCA indices for Burgenland compared to other Countries 2010-2014

Country	2010	2011	2012	2013	2014
Hungary	2.6	3.3	3.5	4.0	4.4
Sweden	0.9	0.9	1.2	1.4	2.1
Slovakia	1.0	1.1	1.2	1.5	1.5
Spain	0.8	1.3	1.3	1.3	1.3
Turkey	1.8	1.7	1.4	1.2	1.3
Romania	2.2	1.2	0.9	1.0	1.3
China	1.2	1.5	1.4	1.2	1.3
Great Britain	1.2	1.2	1.2	1.1	1.1

Source: Author's calculation/Statistik Austria, not rounded

Other countries with a benchmark $RCA > 1$ are Slovakia, another market on the doorstep of Burgenland, Spain, Turkey, Romania, China and Great Britain. According to UNCTAD and WTO, between 2009 and 2010 the highest growth rates in the world were registered by the least developed countries (13.5 percent), followed by developing Asia (9.5 percent) and America (8.1 percent).²¹

For Burgenland, trade to only one Asian market, China, is significant. The other thriving markets are members of the European Union and related nations. There is a mutually beneficial relationship between Burgenland's economy and the economies of adjacent countries. Considering the RCA indices of different product groups, the most important categories in 2014 were plaiting (included in this category are bamboo and reed), cereals and oil seeds.

Table 4.: RCA indices for the top 20 product groups of Burgenland 2010-2014

Product group - Ranked by 2014 values	2010	2011	2012	2013	2014
Plaiting	37.1	1.1	0.8	10.2	20.9
Cereals	8.0	6.2	6.9	13.7	12.6
Oil seeds, oleaginous fruits, seeds, straw	6.4	4.3	9.1	15.5	11.9
Silk	5.2	8.4	12.1	12.0	10.8
Books, newspapers	12.2	4.2	4.3	11.2	9.5

²¹ UNCTAD, "In 2014, world merchandise exports grew by 0.6 percent, while trade in services recorded a 4.2 percent global increase".

Product group – Ranked by 2014 values	2010	2011	2012	2013	2014
Staple fibres	6.6	1.9	2.2	7.9	7.8
Waste from the food industry, food	11.9	4.0	3.5	7.3	7.5
Plants and floricultural products	9.8	2.1	1.7	7.0	7.0
Fur skins and artificial fur; manufactures thereof	5.1	3.0	4.4	6.1	6.4
Textile articles, rags	6.9	1.7	1.8	5.3	5.0
Clothing and Accessories, except knitted/crocheted	3.9	6.2	6.0	4.6	3.9
Various products	3.1	2.3	1.3	2.9	3.5
Cocoa and cocoa preparations	2.5	3.3	2.9	2.7	2.8
Electronic machines	3.0	2.2	3.0	2.5	2.8
Clothing knitted or crocheted	2.0	5.2	4.5	2.5	2.4
Various food preparations	1.3	0.8	0.9	1.4	2.2
Rubber and articles thereof	1.8	0.9	1.1	2.4	2.1
Leather, saddlery, travel goods, handbags	1.2	2.9	3.1	2.5	2.0
Preparations of cereals, flour, bakery products	2.6	1.3	1.2	2.0	2.0
Coffee, tea, spices	1.4	0.4	0.5	2.3	2.0

Source: Author's calculation/Statistik Austria, not rounded

The observations show large fluctuations over the years. The RCA index for the product group plaiting for example ranges from 37.1 in the year 2010 to 0.8 in the year 2012. Different product groups have different ranges of variation over the years. Plaiting shows the largest range. Cocoa and cocoa preparations are relatively constant, ranging from 2.5 in the year 2010 to 3.3 in the following year (Table 4).

Evaluating the RCA index of the product groups in different sectors in the observed period shows that fur skins and artificial fur has among the largest growth in Burgenland as do the category "various products" and products in the areas of food preparation and preparation of vegetables, fruit and plants (Figure 2). "Various products" as defined here include in the case of Burgenland the product groups pencils and zippers. Two enterprises which manufacture these products have establishments in Burgenland. An upward trend is also seen in the product group pearls, precious or semiprecious stones and coins. Important in the list are furthermore products of the textile industry, like silk, textile articles, clothing and accessories, clothing, leather, and furthermore various food preparations and preparations of cereals, flour and bakery products, concerning the food industry.

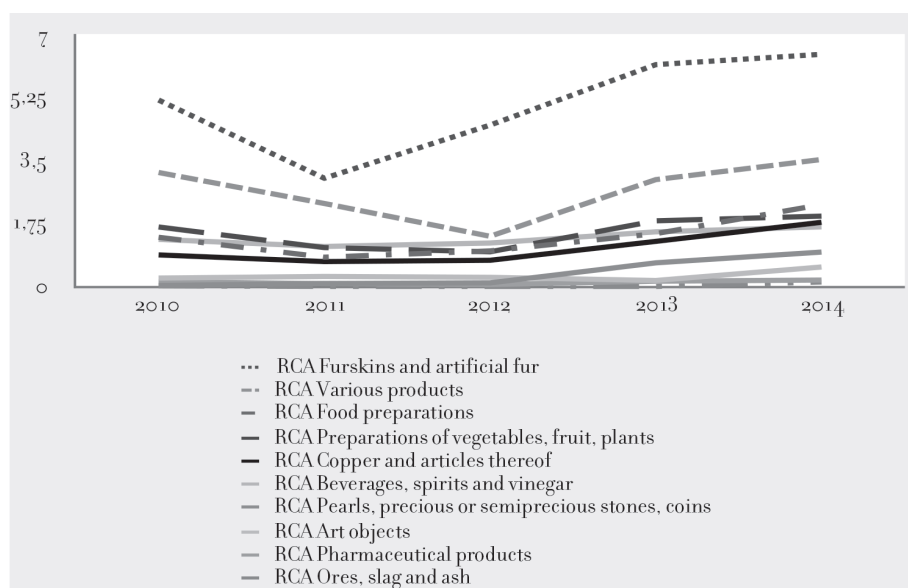
Significant factors also newspapers and magazines. No product groups show only an upward trend. Over the years' variations are recorded.

H 2: The share of agricultural products in export has declined in Burgenland compared to Austria as a whole in favor of technological products.

Comparing the absolute numbers of the 97 product groups which are given in the product catalogue of Statistics Austria, the export share of agrarian products rose from 20 to 25 percent in the years 2010 to 2014. This calculation and also the RCA index show that, contrary to H2, the share of agricultural products increases. H 2 is false. Indeed, the top three product groups in 2014 - plaiting, cereals and oil seeds - are all of agrarian origin.

This means that Burgenland's economy has a high relative share in these groups compared to the wider Austria's exports. Staple fibres and electronic machines, technological products, were the sixth and fourteenth most important product groups in 2014.

Figure 2.: Product groups with the largest growth IN BURGENLAND, 2010-2014



Source: Author's calculation

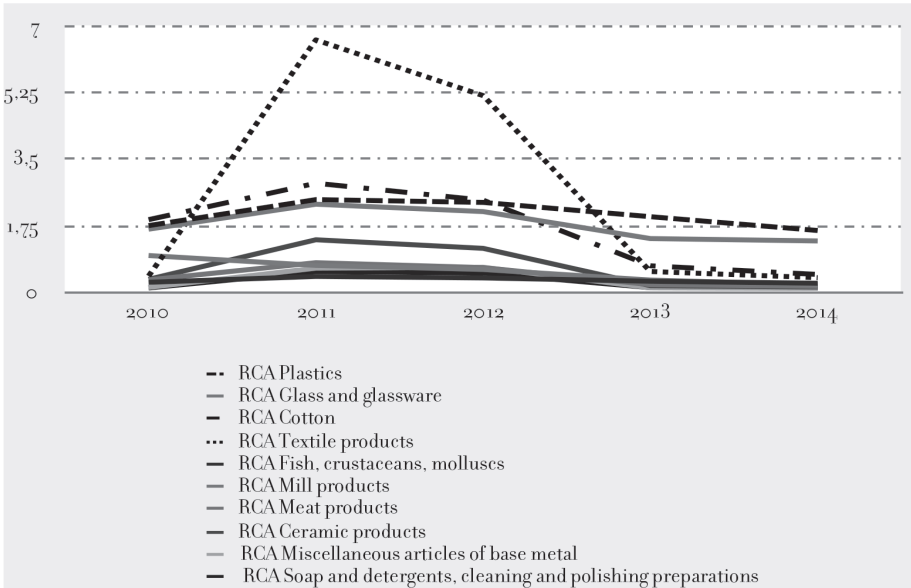
From 2010 to 2014 the product groups fur skins and various products showed all in all a great upward trend. Moderate growth was in food preparations, copper and articles thereof, beverages, spirits and vinegar. The fluctuations of the product groups pearls, precious or semiprecious stones, coins, art objects, pharmaceutical products and ores, slag and ash are moving at a low level.

Looking at the products that can be defined in the broadest sense to be agricultural, these product groups are a sustainable base for the further development of

trade balance. The export share of agrarian products in Burgenland was 20 percent in 2010 and 23 percent in the year 2014. Burgenland is an agrarian region with a growing export share.

This is also reflected in the calculations of the RCA index. In the product groups which have recorded growth during the observation period are a disproportionate number of agricultural origin: Food preparations, preparations of vegetables, fruit, plants, beverage, spirits and vinegar.

Figure 3.: Product groups with STRONGEST declines IN BURGENLAND, 2010-2014



Source: Author’s calculation

The RCA index shows a sharp decline in the areas of textile products and cotton in the year 2013 after the highest increase in 2011. Some textile companies have withdrawn their production from Burgenland, the production moved to other Austrian regions or even other countries.

Moderate declines in plastics and mill products can also be seen during the entire observation period. As with the increasing products, the RCA index for declining products also shows strong variations (Figure 3.).

From 2010 to 2014 the product groups ceramic products, fish, crustaceans, mollusks, meat products, miscellaneous articles of base metal and soap and detergents, cleaning and polishing preparations show declines at a low level.

5. DISCUSSION

Observation by RCA index shows that Burgenland has - especially in the product categories for which it is due to the geographical and climatic conditions suitable - a great advantage over the Austrian exports, for example reed, cereals, oil seeds, straw. Burgenland is the region with the most hours of sunshine in Austria and good production conditions for agriculture, especially compared to the higher situated areas in the western part of Austria.

To check the significance of the results, it is necessary to compare the data with the business directory of the Economic Chamber of Burgenland. A comparison of the results shows the global players and hidden champions of Burgenland's economy, e.g. in the agrarian sector there are important companies like Felix Austria, Mars, Pöttelsdorfer Edelpüte, Rebschule Tschida, Schärf coffeeshop, Pioneer and various wineries and in the technical sector there are other important companies like Trevision, Seal Maker, Vossen, Lenzing, Isosport, Medtrust, YKK, Hella, Brevillier-Urban and Boxmark Leather.

The listed companies have a high export ratio and have established contact with the Foreign Trade Department of Commerce or have applied for export papers. A comparison of the secondary data from the corporate directory and business partner database of Commerce Burgenland confirms the analysis.

EU Cohesion Policy sets a framework to reduce differences between regions. Burgenland, which is the focus of this study, is a federal state of Austria and had a special status as an Objective 1 area. The Vienna Institute for International Economic Studies (wiiw) analyzed foreign trade flows for several European countries. "For regional policy strategies to be effective, and for an efficient use of the available funds, it is crucial to analyze in detail the assets each region is endowed with, the technologies available, and the business connections among different regions. Against this background, the study evaluated EU regions' international competitiveness on the basis of their Revealed Comparative Advantage (RCA), complemented by additional trade indicators such as trade balances or export specialization and a series of regional and sectoral characteristics such as skill supply, R&D and patents. For this study, wiiw developed a model to consistently estimate foreign trade flows (export and imports) at the NUTS-2 regional level"²².

But isn't the RCA index a superficial measure of export trade? This method does not measure the circumstances of the market, or show economic and political implications. One alternative is Constant Market Share-Analysis which considers the effects of the world market, of varied patterns, of regional structure and competition.

Leromain and Orefice introduced another method of analysis, a new economic-based measure for Ricardian RCA. In their opinion, the new, modified measure showed better statistical properties than the Balassa index.²³ They extended the

²² Römisch, "Trade competitiveness of Austrian and neighbouring regions", 6.

²³ Leromain and Orefice, "New Revealed Comparative Advantage Index: Dataset and Empirical Distribution".

measure in two main directions, using a higher level of sector disaggregation and a larger set of partner countries.

The absolute level of exports indicates nothing about the extent to which a country is dependent on the international division of labor. In order to obtain such an assessment, exports must be considered in relation to gross domestic product. For deeper analysis multiple parameters must be included. The RCA index is useful for an initial assessment, and is applicable for countries, product groups, and time series. A forecast generated by the present data is problematic, because the data for product groups and the values of export share to foreign countries have in most cases a large inter-annual variation. It is worth paying attention to the development of countries with an RCA index less than one, like Croatia. This market has an increasing importance for Burgenland's economy, and its index has risen from 0.6 in 2010 to 0.7 in 2014.

In the opinion of Brakman one of the major new developments in the character of international trade over the last 25 years has been the increased fragmentation of the production process.

Many traded products are produced in international supply chains. For international trade analyzes this is an important development as gross exports are painting an incomplete picture of the nature of international trade. Brakman analyzed Revealed Comparative Advantage in the field of gross versus value added trade flows. With respect to comparative advantage the differences between the two types of data are often illustrated by means of examples using a single sector. In the Ricardian theory of comparative advantage, however, the position of a commodity versus all other commodities in a country determines whether or not a sector has a comparative (dis)-advantage. His conclusion: RCA calculated with value added data is the most useful²⁴.

6. CONCLUSION

The RCA index was selected for this study to determine the most important destinations for the region's trade. In international economics RCA is used to obtain results for a specific country or an individual business. In this study officially-available data was used to calculate the RCA index for a specific district relative to the entire state, with reliable results.

Results show that the RCA index can be used to show the value of exports from a federal state to particular nations. The analysis is able to evaluate the export share of a district for different product groups and export destinations.

The upward trend in RCA in recent years is an important signal for the whole economy. Exports create growth and jobs. Internationalization is therefore an important component of our business strategy to protect jobs and prosperity in the region. Nearly 5 percent of the 17,000 companies of the region are engaged in exports,

24 Brakman and Van Marrewijk. A closer look at Revealed Comparative Advantage: Gross-versus value added trade flows.

half of the Austrian average. The results of this study imply that the number of exporters in Burgenland will increase in the near future.

The results of this study indicate that there are many economically interesting product groups in the region, this situation is therefore little or very little known to the public.

Burgenland is well known for wine around the world. But this study also shows that there are a lot of hidden champions in agriculture, commerce. Industries flourish in obscurity, like the production of reeds, belonging to the category plaiting, cereals, oil seeds or magazines and newspapers. Wine only plays a minor part despite its higher profile.

A look at the categories with significant growth potential indicates that the food sector, industrial production (car and medicine), and jewelry are promising markets.

In contrast, the textile industry in terms of exports is declining. The product groups textile, glass and glass ware, cotton, ceramic and mill products show also declining trends.

The economic relations to the neighboring country Hungary are intense. It would be of interest, if the upward tendency in exports can be associated with company settlements and cooperation in the neighboring country. An analysis of the exporting countries in connection with the product groups would be of great interest to recognize other trends and influences. The geographical location is probably the explanation for the good business relations to Hungary and Slovakia.

A comparison with the company database of the Economic Chamber of Burgenland suggests that the good economic relations to Sweden are founded by Swedish company branches in Burgenland.

Other recommendations for further research work: wherever scientific research is done, it expands the field of study so that the same topic can be further addressed from other perspectives, using other approaches or other benchmarks.

This study focuses on a limited time period and a particular region. In further work, it would be useful to examine longer time periods and expand the analysis to other Objective 1 areas in the European Union.

To understand the significance of a region in foreign markets, it is necessary to analyze the structure of activities in those markets. In addition to physical goods, service exports such as tourism, transport, telecommunication, insurance and construction play an increasingly important role.

The research objectives were achieved, but the results shown here only provide a measure of the importance of Burgenland merchandise exports. An additional study investigating the role of service exports would be of value to give an overview of Burgenland's export economy.

REFERENCES

- Anzinger, Barbara and Martin Müllner-Stefenelli, "Analyse des Wiener Außenhandels" (Vienna: *Wirtschaftskammer Wien*, 2012), internal survey
- Balassa, Bella, Trade Liberalisation and Revealed Comparative Advantage, *The Manchester School*, 33 (1965): 99-123
- Batra, Amita and Zeba Khan, Revealed Comparative Advantage: An Analysis for India and China. Indian Council for Research on International Economic Relations NO. 168 (2005)
- Bowen, Harry P., "On the theoretical interpretation of indices of trade intensity and revealed comparative advantage." *Weltwirtschaftliches Archiv* 119.3 (1983): 464-472
- Brakman, Steven and Charles van Marrewijk, A Closer Look at Revealed Comparative Advantage: Gross-versus Value Added Trade Flows (2015). CESifo Working Paper Series No. 5321
- "Der grüne Bericht 2009", Amt der Burgenländischen Landesregierung, accessed April 21, 2016, http://www.burgenland.at/fileadmin/user_upload/Downloads/Umwelt_und_Agrar/Agrar/Publikationen/Cruener_Bericht/1870_Cruene_Bericht_2009_kl.pdf
- Donges, Juergen B. and James Riedel. "The expansion of manufactured exports in developing countries: An empirical assessment of supply and demand issues." *Weltwirtschaftliches Archiv* 113.1 (1977): 58-87
- "Exporte und Importe burgenländischer Unternehmen", Wirtschaftskammer Burgenland, accessed April 21, 2016, <https://www.wko.at/Content.Node/Interessenvertretung/Daten--Fakten--Zahlen/b/Exporte-Importe-2010---2015.pdf>
- "Export- und Importquoten", Statistik Austria, WIFO, accessed March 15, 2016, <http://wko.at/statistik/Extranet/Langzeit/Lang-AHquoten.pdf>
- Granabetter, Doris M., "Export between the Poles Globalisation and Regionalisation-using the Case of the Austrian District Burgenland", *Journal of EU Research in Business*, 1-6, Vol. 2016, Article ID 900383, doi: 10.5171/2016.900383, 2016
- Hishamunda, Nathanael, Cai JunNing and Leung PingSung, Assessment of comparative advantage in aquaculture: framework and application on selected species in developing countries. *FAO FISHERIES AND AQUACULTURE TECHNICAL PAPER*, 528. ISBN 9789251064320, ISSN 2070-7010, 2009
- Jia, Lijung, Maoguo Wu and Yixuan Liu, "The Evolution of Measurement Methods of Comparative Advantage and New Trends in Intra-Product International Specialization", SHU-UTS SILC Business School, Shanghai University, China, *European Scientific Journal* 12.7 (2016). accessed June 12, 2016, doi: 10.19044/esj.2016.v12n7p82, <http://dx.doi.org/10.19044/esj.2016.v12n7p82>
- Leromain, Elsa, and Gianluca Orefice, "New Revealed Comparative Advantage Index: Dataset and Empirical Distribution", *International Economics* 139 (2014): 48-70
- Republik Österreich Parlament, Warnmechanismusbericht 2016, Information des Budgetdienstes, 4, accessed May 6, 2016, <https://www.parlament.gv.at/ZUSD/BUDGET/BD--Warnmechanismusbericht.2016.pdf>
- Römisch, Roman, "Trade competitiveness of Austrian and neighbouring regions", *wiiw monthly report* Nr. 12/2015: 6 - 12, accessed June 6, 2016, <http://wiiw.ac.at/monthl-report-no-12-2015-dlp-3758.pdf>
- Rübel, Gerhard, Außenwirtschaft (München: Oldenbourg Wissenschaftsverlag GmbH, München, 2013)
- Serin, Vildan and Abdulkadir Civan. Revealed Comparative Advantage and Competitiveness: A Case Study for Turkey towards the EU. *Journal of Economic and Social Research* 10(2), (2008), 25-41

"Statistik der Landwirtschaft", Statistik Austria, ISBN:978-3-902925-79-4, accessed April 21, 2016, http://www.statistik.at/web_de/statistiken/wirtschaft/land_und_forstwirtschaft/agrarstruktur/flaechen_ertraege/arbeitskraefte/index.html

UNCTAD, "In 2014, world merchandise exports grew by 0.6 percent, while trade in services recorded a 4.2 percent global increase", April 4, 2015, accessed May 16, 2016. http://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=975&Sitemap_xo020_Taxonomy=Statistics

UNCTADSTAT, General Profile: Austria, General Information for 2014, accessed May 5, 2016, <http://unctadstat.unctad.org/CountryProfile/GeneralProfile/en-GB/040/index.html>

Vollrath, Thomas L. "A theoretical evaluation of alternative trade intensity measures of revealed comparative advantage." *Weltwirtschaftliches Archiv* 127.2 (1991): 265-280

"Wirtschaftskammermitglieder nach Bundesländern", WKO Statistics, accessed March 9, 2015, <http://wko.at/statistik/jahrbuch/mg-km.pdf>

Zou, Shaoming, and Simona Stan, "The determinants of export performance: a review of the empirical literature between 1987 and 1997", *International Marketing Review*, Vol. 15, Iss: 5 (1998)

THE IMPORTANCE OF HUMAN RESOURCES FOR COMPANIES WITH ENERGY PROFILES AND THEIR INFLUENCE IN RAISING THE OPERATING EFFICIENCY

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ABSTRACT

Human resources are the most important part of the operation in an enterprise. Based on this logic, companies must continuously invest in increasing the performance of internal capacity through the creation of their strategies which will define clear developing objectives. Enterprises, be it large or small companies, private or public, especially companies with energy profiles such as power plants or district heating, to offer their services, an internal organization of a high level is needed. This arrangement inevitably must include human resources. In our case, we have analysed the functioning of District Heating "Termokos" in Pristina, which for a year now operates with a new system of providing thermal energy - cogeneration project. Of course this also requires changes in the functioning of the enterprise reorganization, since we are dealing with the creation of new departments which require qualified and professional framework. During the analysis, we will focus on current data that we have from District Heating. To process the data we are using recognized statistical methods and similar models through which we will give our recommendations, for better functioning of the enterprise

Keywords:

Energy, Human resources, Enterprise, Management, Cogeneration Project

1. INTRODUCTION

Every organization, large or small, especially companies with energy profiles as District Heating or Power Plant, use a variety of capital to make the business or their services work. Capital includes cash, valuables, or goods used to generate income for a business. For example, a retail store uses registers and inventory, while a consulting firm may have proprietary software or buildings. No matter the industry, all companies have one thing in common: *they must have people to make their capital work for them.*

Human resource management (HRM) is the process of employing people, training them, compensating them, developing policies relating to them, and developing strategies to retain them. As a field, HRM has undergone many changes over the last twenty years, giving it an even more important role in today's organizations. In the past, HRM meant processing payroll, sending birthday gifts to employees, arranging company outings, and making sure forms were filled out correctly—in other words, more of an administrative role rather than a strategic role crucial to the success of the organization.

From different kinds of definitions, one of the most simple and precise ones is "Human resource management is an attraction, development and work maintenance process to support the organizational mission, objectives and strategies" (J.Schermehon, 2001), related to this base we are talking about a process which requires devotion, treatment and empathy.

The focus of this work is the proposal how to reorganize the functioning of a company with an energetic profile/ district heating. This reorganization will contain the suppression/modification/creation of new departments from the company, in order to raise the management of capacities of the human resources. We will build new models to show how a company needs to function, and how it needs to orient when it comes to the same kind of development by raising human capacities.

2. HYPOTHESIS

The managers of companies with energetic profile have not yet gained the level of awareness for the importance of human resource management. Based on this hypothesis we have built the basic pillar from which our work has been organized, which also relies on the relying hypothesis, in which the most spread model in organizations of this profile is made to be a traditional /administrative model. In neither of the phases even if the company had a change or a development, its concept for human resource management was never changed.

3. METHODOLOGY

We have used a methodology which consists a combination of primary and secondary sources. A considerable amount of secondary sources was secured through using electronic resources, different university libraries and relevant literature. While when it comes to primary sources, we have used internal company information from which we have built our own proposals to change the human resource management. We have used information from the form of organization and human resource management in companies with energetic profile, in our case the city heating, an organization which results to be a traditional one.

To analyze the model of human resource management which companies with energetic profile /city heating use, and to fulfill this comparative study, based on the actual situation we have given some discussions and analysis related to the actual operation of the heating. All this happens specifically because of the same one has entered in the new phase of its function, with the start of thermal energy production with cogeneration - a combined production of electrical and thermal energy.

4. CASE STUDY - DISTRICT HEATING PRISHTINA, CURRENT SITUATION

Our district heating has 213 workers in total. All the workers of all departments are included in this number. In technical operation part, in the department of Distribution and Production of thermal energy, approximately 70% of the workers are included. Normally this situation continues to be the same even after the implementation of the co-generation project. From now on, the functioning of the heating with combined production of energy has taken a new track, which will necessarily ask for reorganization / restructuring of staff functioning. This reorganization will affect two technical departments the most, distribution department and production department, since after insuring most of the thermal energy, heating will face stable production to our clients.

To raise effectiveness of our company, within the reconstruction of technical departments, there will be new positions created.

Our case study - The city of Pristina has an installed thermal network for supply of district heating which was built during 1970s. Until now as a source for production of heating energy were used heat only boilers which operate on heavy oil with a low heat combustion $H_u = 36.000 \text{ kJ/kg}$, but now the entire thermal energy is produced through the cogeneration system - combined heat production. The system has a total of 69942m of pipeline and 3250 m^3 of water in the network. (Data from archive of District Heating "Termokos")

Being in a difficult financial situation, the District Heating of Pristina was unable to provide service to its customers due to a high price of heavy oil which was €680/

ton, making it a burden for the budget of Municipality and Government of Kosovo. Why did this happen? A one day operation with reduction cost Termokos €68.000/day only for purchase of heavy oil, without including other operation expenses. Now, there was only one possibility and that was to implement the cogeneration project and offer stable heat supply to customers with lower/affordable cost.

"The main advantage of cogeneration - the highest overall efficiency for the conversion of fuel to heat and electricity - is the reason the new solutions and improvements are putting cogeneration units in new roles, faced with challenges to contribute to global energy and environment goals" (*Jozef Stefan Institute "Cogeneration Case Studies Handbook", Energy Efficiency Centre (2011), Ljubljana*)

"Implementation of these priority investments would help achieve the following targets: reduction of water loss by around 50% of the current level, lowering of CO₂ emissions -86.500 ton/yr., electric energy savings - 500 MWh/yr., increased operation safety and supply security, Reduction of technical loss, Reduction of interruptions as a result of failures in the network, Facilitation of consumption based billing, Improvement of the quality of heating. Improvement of the reputation of Termokos, Reduction of customer complaints, Improvement of the collection rate, Distance monitoring and control of heat, Possibility of remote control/regulating the quality of heat from the central heating plant". (Infrastructure Project Facility Technical Assistance Window (IPF TA) Western Balkans)

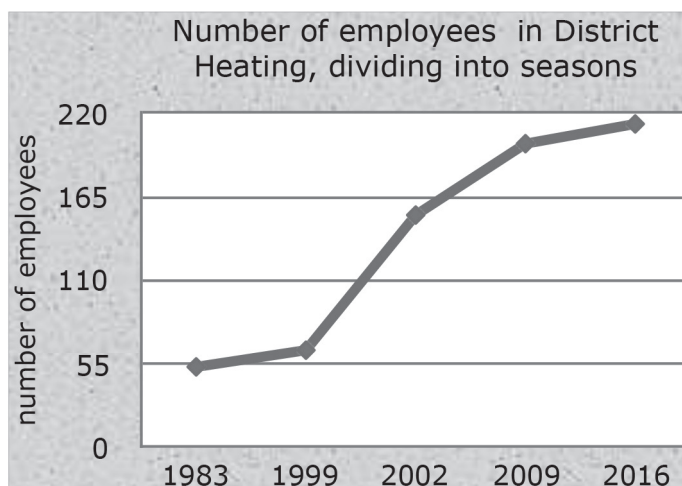
Now, after successful project implementation, begin the first challenges of managing. Of course to operate with such systems should have, the professional staff, young staff that guarantees greater stability. So is District Heating ready for these challenges?

Knowing that, the staff has a relatively old age. Enterprise is overloaded with employees. Employment after the war mainly conducted in political criteria, unfortunately to excluded professional standards. All these are dilemmas that rightly raise when discussing the company with readiness.

5. RECONSTRUCTION OF DEPARTMENTS, THE IMPACT IN THE FUNCTIONING OF THE COMPANY

After the establishment of the heating in the 70's, the numbers of the workers has changed constantly. This growth has not necessarily happened based on the real needs of the company, in the growth of efficiency in the services offered. Graph (Fig.1) presents the difference of how this number has changed through years.

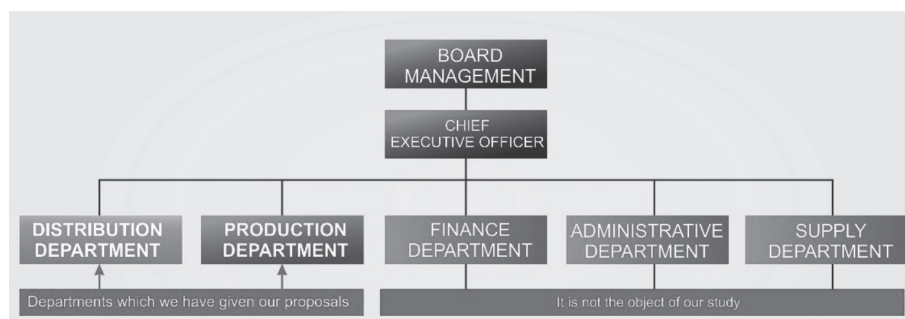
When it comes to needed restructuring which should be made in a company, we have proposed to create new departments; passivization of one of the existing departments and the engagement of the new qualified staff by matching it to the new form of company operation.

Figure 1.: Number of employees in District Heating

Source: Authors'

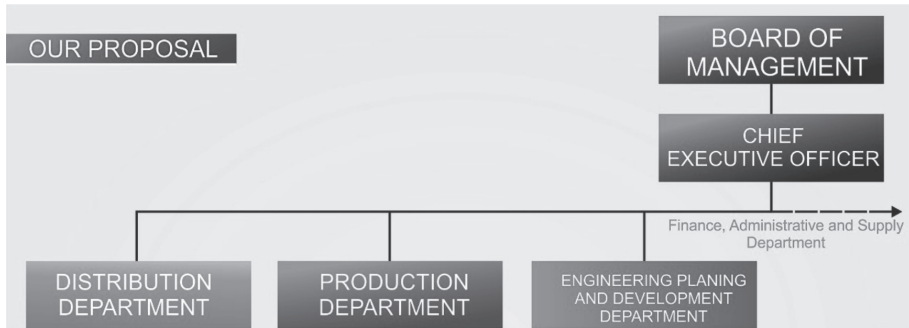
Reconstruction should raise the efficiency and effectiveness of the company by interfering in the two main departments: Distribution department and Production/Co-generation department. In the Distributing part we should aim to stable the loss in that branch, maintain thermal substations and communication progress. In Production/Co-generation part there should be precise positions defined proposed in the bottom scheme, since now with this new form of energy production some positions should be left passive and the same ones should pass through co-generation part.

Engineering Planing and Development Deptment, a department which does not exist at all in the scheme of enterprise, is proposed to be created and to have a big impact. This department should be the mechanism which creates developing strategies for technical planning inside the company. Designing of professional technical - economical projects, designing of strategies for capital investments to proposing needed inovative and contemporary projects.

Figure 2.: DH scheme before the Implementation of the cogeneration project

Source: Authors'

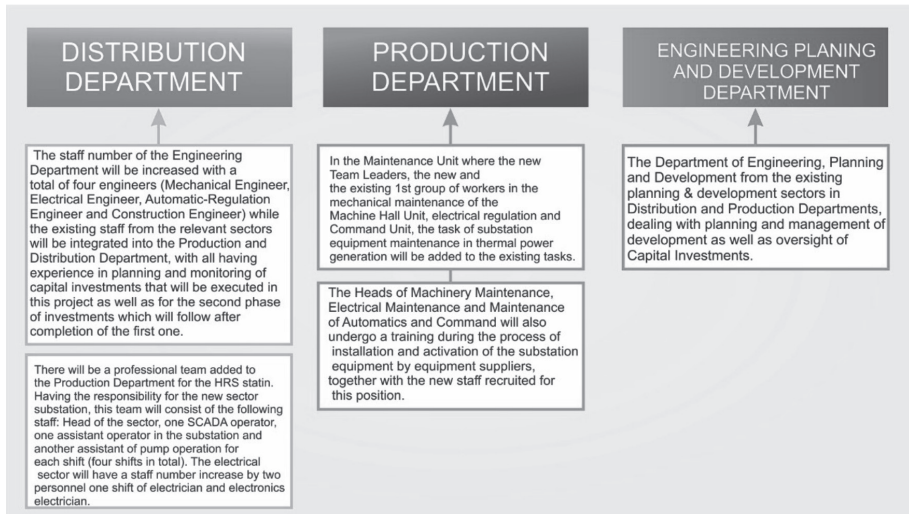
Figure 3.: Changes that we have proposed dealing with the part of the technical organization.



Source: Authors'

Figure 4.: Changes that we have proposed dealing with the part of the technical organization.

Source: Authors'



The substation at the TPP Kosovo B will operate within the framework of TPP Kosovo B without any requirement for change or expansion of the Organizational Scheme.

Operation and Maintenance at the TPP Kosovo B substation will be performed by the existing KEK Operation and Maintenance units.

Organizational scheme does not require any immediate changes. Although, the Operation and Maintenance units need to be supported with additional staff which is expected to be transferred from other TPP Kosovo B departments.

New and existing employees in the position of Assistant Operator on the Outside Buildings, apart from the existing tasks, the task of operation of substation equipment in thermal power generation will be added according to instruction given from the producer of equipment.

The same applies for the Maintenance Unit where the new Team Leaders, the new and the existing 1st group of workers in the mechanical maintenance of the Machine Hall Unit, electrical regulation and Command Unit, the task of substation equipment maintenance in thermal power generation will be added to the existing tasks.

The Heads of Machinery Maintenance, Electrical Maintenance and Maintenance of Automatics and Command will also undergo training during the installation and activation of the substation equipment by equipment suppliers, together with the new staff recruited for this position.

It is recommended to organize a one week workshop for the new Team Leaders with a similar equipment unit elsewhere in Europe, in accordance with the producers of the equipment in the Maintenance Unit.

The Department of Engineering, Planning and Development - from existing planning & development sectors in Distribution and Production Departments, dealing with planning and management of development as well as oversight of Capital Investments.

There will be a responsible team added at the Production Department for the DH Termokos substation. Having the responsibility for the new sector substation, this team will consist of the following staff: Head of the sector, one SCADA operator, one assistant operator in the substation and another one assistant pump operator for each shift (four shifts in total). The electrical sector will have a staff number increase by one shift of electrician and electronics electrician. The existing operation and maintenance staff of the steam boilers will assist as required the substation staff whenever necessary.

The staff number of the Engineering Department will be increased with a total of four engineers (Mechanical Engineer, Electrical Engineer, Automatic-Regulation Engineer and Construction Engineer) while the existing staff from the relevant sectors will be integrated into the Production and Distribution Department, with all having experience in planning and monitoring of capital investments that will be executed in this project as well as for the second phase of investments which will follow after completion of the first one.

To all the existing staff in the Production Department, from the position of the Head of Department to the position of physical employee, the position of Operation / Maintenance of the DH Termokos substation equipment will be added to the job descriptions.

For the operators in the SCADA room it is necessary to organize training according to manufacturer recommendations in a similar working environment, where similar equipment is installed. For the new electricians and assistants, operators and existing employees, such training should be organized during the equipment assembly in the DH Termokos substation from the equipment suppliers.

6. STEPS THAT NEED TO BE TAKEN

To raise the efficiency of human resources by all means there need to be concrete actions which the company needs to take, actions which are missing for a long time. There has to be a detailed strategy including the part of real executions which have to precede these steps, knowing that a series of acts within a process are requested to be involved. Changes which need to be made ask for the will power of those responsible, considering that in some important sectors which will have an impact in company's further functioning there are some interventions which need to be taken.

Until now, there are no concrete actions undertaken in the function of reconstructing the company, in order to raise the efficiency of human resources. Without a doubt there these actions should not be delayed, considering the good situation in which our company is, in a sense of improving the supply of thermal energy.

Application of changes in the scheme of functionality will surely raise company's efficiency in two important departments, the ones for production and distribution. These two sectors bear the main burden of the company in all aspects including the generation of the income within the company. Eventual moves of the staff in these two parts will bring new energy and professionalism.

7. CONCLUSION

The role of human recourses in stable thermal energy supply has a substantial importance, starting from the creating of its politics and their empowerment.

Enterprises in general, but especially those with profile engineering / energy they need to be prepared within the top level, to be competitive with global market.

Enterprises should invest unsparing in their capacity for advanced and customized resources that possess with market requirements. Today, engineering enterprises do not possess the necessary framework to provide quality services. Their framework is the average age despite qualification; they have the lack recognition of foreign languages, advanced manipulation programs etc. Of course, as in any country in transition after a war, there are difficulties in establishing order and development. Of course this also contributes to employment in public companies / state, becoming placements in the party political basis, without professional criteria. These situations cause major problems in the efficiency of enterprises, thus hampering the provision of services.

Management of enterprises should take care of their staff. How to do it? This can be done by investing in capacity building within the framework, conducting training, home and abroad, investing in the performance of expertise and specialization. Also the enterprise should treat especially engineer's as under deficit. Management should create policies to the staff, and clear strategy to recruit their staff, as we know is difficult to create an engineer.

REFERENCES

- Kristen B. Frasch, David Shadovitz, and Jared Shelly, "There's No Whining in HR," Human Resource Executive Online, June 30, 2009, accessed September 24
- Leigh Rivenbark, "The 7 Hidden Reasons Why Employees Leave," HR Magazine, May (2005), accessed October 10, 2010
- District Heating "Termokos" JSC Prishtinë - Data from archive of D.H "Termokos" (schemes of principle operation and information materials)
- The European Union's 2008 IPA Programme for Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Montenegro, Serbia, Kosovo (under UNSCR 1244/1999) and Turkey Infrastructure Project Facility Technical Assistance Window (IPF TA) Western Balkans Feasibility Study Report June 2010 - March 2011
- Peter Cappelli, "HR Implications of Healthcare Reform," Human Resource Executive Online, March 29, 2010, accessed August 18, 2011
- William P. Webster, "Maintaining Quality Relationships between Labor and Management," National Productivity Review, Spring (1997)
- Cedric Herring, "Does Diversity Pay? Racial Composition of Firms and the Business Case for Diversity" (paper presented at the annual meeting of the American Sociological Association, Montreal, Canada, August 11, 2006), accessed May 5, 2009
- Scott E. Page, The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools, and Societies Princeton, NJ: Princeton University Press, (2007)
- William J. Holstein, "Diversity is Even More Important in Hard Times," New York Times, February 13, 2009, accessed August 25, 2011,
- Roy Adler, "Women in the Executive Suite Correlate to High Profits," Glass Ceiling Research Center.
- J. Richard Hackman and Greg R. Oldham, "Motivation through the Design of Work: Test of a Theory," Organizational Behavior and Human Performance 16, no. 2 (1976)
- W. P. Carey, "Employees First: Strategy for Success," Knowledge @ W. P. Carey, W. P. Carey School of Business, Arizona State University, June 26, 2008, accessed July 11

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