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CONTENTS

INVESTIGATION OF UNIVERSITY STUDENTS' EFL WRITING APPREHENSION: A LONGITUDINAL STUDY IN CROATIA

Moira Kostić-Bobanović 5

DEVELOPING MARKETING STRATEGY OF POULTRY MEAT SUPPLY IN EU-28 COUNTRIES: MULTIVARIATE ANALYSIS APPROACH

Miro Simonič, Ksenija Dumičić, Berislav Žmuk 19

THE LINK BETWEEN STUDENTS' SATISFACTION WITH FACULTY, OVERALL STUDENTS' SATISFACTION WITH STUDENT LIFE AND STUDENT PERFORMANCES

Zoran Mihanović, Ana Barbara Batinić, Jurica Pavičić 37

THE DRAWBACKS AND REFORM OF CHINA'S CURRENT RURAL LAND SYSTEM: AN ANALYSIS BASED ON CONTRACT, PROPERTY RIGHTS AND RESOURCE ALLOCATION

Guo-ping He, Hou-qing Luo 61

CORRELATION BETWEEN THE PENETRATION STRATEGIES AND MARKETING MIX OF INTERNATIONAL HOTEL CHAINS IN ROMANIA

Cosma Smaranda Adina, Fleşeriu Cristina, Bota Marius 79

THE EFFECTIVENESS OF INNOVATION PROJECTS IN POLISH INDUSTRY

Jan Zwolak 97

CAUSAL PEER EFFECTS IN FINANCIAL DECISION MAKING

Ana Njegovanović, Krešimir Petar Ćosić 111

INVESTIGATION OF UNIVERSITY STUDENTS' EFL WRITING APPREHENSION: A LONGITUDINAL STUDY IN CROATIA

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ABSTRACT

Writing apprehension defines a person's ability to write under various stress types. Depending on a situation, an average person might perform below expectations, or be less apprehensive about writing than a professional. The purpose of this research is to investigate Croatian University students' English as a foreign language writing apprehension. For the purpose to determine if the variables of students' gender and academic level (age) play a role in their writing apprehension, we adapted WAT (Writing Apprehension Test) so this would be tailored to our study population. A longitudinal study was conducted among the students who were studying at the University of Juraj Dobrila, Pula. The participants were tested twice: in the first and in the third year. The results of the study indicated that, in contrary to respondents' gender, academic level was significant variable in their estimates of writing apprehension. In accordance with the findings stated above, a number of recommendations for handling writing apprehension were set.

Keywords:

writing apprehension, longitudinal study, gender, academic level, English as a Foreign Language (EFL)

1. INTRODUCTION

Writing Apprehension, a subject and situation specific anxiety about writing, is related to a variety of measures of self-esteem and personality in a lot of studies (Daly and Miller, 1975; Daly, 1978; Shell, Murphy, and Bruning, 1989; Pajares and Johnson, 1993; Shell, Colvin and Bruning, 1995; Dickson, 2001; Stolpa, 2004; Kurk and Atay, 2007).

The term writing apprehension was coined by Daly and Miller (1975). It refers to a situation and subject specific individual difference associated with a person's tendencies to approach or avoid situations perceived to potentially require writing accompanied by some amount of perceived evaluation.

It is generally understood to mean negative, anxious feelings (about oneself as a writer, one's writing situation, or one's writing task) that disrupt some part of the writing process. The term is used to describe writers who are intellectually capable of the task at hand, but who nevertheless have difficulty with it (Grabe and Kaplan 1996). These feelings may not be pervasive in a person's writing life. For example, a person might feel perfectly fine writing a biology lab report but apprehensive about writing a paper on a novel. Someone might confidently tackle a paper about the sociology of gender but delete and start over twenty times when composing an e-mail to a cute classmate suggesting coffee. According to (Hassan, 2001) writing anxiety is *situational*. The term itself does not describe psychological attributes. People are not born anxious writers, rather, they become anxious or blocked through negative or difficult experiences with writing.

Writing is a language skill that is essential to academic success. Since it is an active, productive skill, students learning to write in a foreign language face multiple challenges. There is an emphasis placed on writing at University Juraj Dobrila in Pula. In the first year class students learn to write short presentations on a specific topic. In the third year students write 10-15 pages documented research paper that has to be presented during their seminary class in front of other students. Additionally they have to write an essay on a specific business situation. They must receive a passing score on each paper in order to pass the exam. Their writing requires thinking strategies that allow the individual to express him or herself competently in the other language, and is a complex activity that requires a certain level of linguistics knowledge, writing conventions, vocabulary and grammar.

The complexity of writing as a task tends to heighten anxiety levels in students who are taking writing courses. According to Sharples (1993) this anxiety can often demotivate the student or lead to discouragement, and thus may result in negative attitudes towards writing. Fear of writing was reported as the number 1 of Americans in a recent nationwide survey of adults. Results from data collected from nearly 20 000 college students at Michigan State University, Illinois State University and West Virginia University over the past eight years, suggest that between 15 and 20 percent

of American college students suffer from debilitating writing apprehension (Smith and Renk, 2007).

Most students, low and high achievers alike, find writing difficult and view it as something they just have to persevere through in order to pass certain exams (Yavuz and Genç, 1998). This may relate to affective elements such as student attitudes, writing apprehension and self-efficacy in writing. In their studies Pajares (2003) and Pajares and Valiante (2001) revealed that if a student is unwilling to express him or herself in writing, lacks confidence in his or her ability to write, or feels apprehensive about writing, then the student is unlikely to be proficient at writing composition.

Regarding the characteristics of the high apprehensive' written work, Daly (1978), confirm that it is of lower quality and their papers appeared to be shorter and have less developed language and sentence structure (Faigley, Daly and Witte, 1991). According to the results of his research Reeves (1997) states that high apprehensive writers have more difficulty with getting new ideas which are not well-developed. The author adds that those students' score lower on measures of syntactic maturity.

In their study, Mochizuki and Aizawa (2000) stated that a number of females in their responses to the open question about causes for their writing apprehension mentioned that teachers deal harshly with their students' errors in writing. Others mentioned that teachers do not give them feedback about their strengths and weaknesses in writing. Some other female students reported that they are being laughed at by their colleagues or teachers when making mistakes (Webb, 2008). The majority of students of both sexes emphasized that their lack of proper vocabulary and grammar necessary for writing and writing teachers lacking experience in teaching writing were the prime reasons behind their writing anxiety. This means that students misunderstand the nature of writing; they believe that writing is just mastery of vocabulary and grammar which is erroneous (Pérez Basanta, 2005).

Although there is a great deal of variation among individuals, there are also some common experiences that *writers* in general find stressful.

For example, a person writing may struggle when:

- adjusting to a new form of writing. (for example, first year college writing or papers in a new field of study Stapa and Abdul Majid, 2009);
- writing for a reader who has been overly critical or demanding in the past (Grundy, 1985);
- remembering negative criticism received in the past even if the reader who criticized students' work won't be reading their writing this time (Maria-Rankin, 2006);
- working with limited time or with a lot of unstructured time (Fritzsche, Young and Hickson, 2003).

Research Question

This study is considered as an investigatory one which aims to investigate Croatian EFL writing apprehension from the learners' own views and hence suggest suitable remedies for this phenomenon. From displaying and investigating the problem of the study, the following question that needs to be answered by the present study, emerged:

Do the variables of students' gender and academic level (age) play a role in their writing apprehension?

Research Hypotheses

In the light of the problem of the present study and the research questions that have been raised and after studying the literature related to this area, it is hypothesized that:

- (1) There are statistically significant differences in estimation of writing apprehension due to students' gender.
- (2) 2. There are statistically significant differences in estimation of writing apprehension due to students' academic level.

2. METHODS

Participants

A study was carried out on a total of 124 informants majoring in tourism, marketing, informatics and finance at University in Pula. These were Croatian-speaking learners of EFL who were tested twice, that is, in the first year and in the third year. The sample was homogeneous as regards social environment and type of instruction. Moreover, learners shared the same L1. All the participants were full time students, at the beginning of the study they were 19 years old. Longitudinal studies are prone to participant attrition, unfortunately, this one was no exception. From the initial 183 participants, 59 students either dropped out of their study or did not attend school during data collection sessions, so there are no longitudinal results for them. Concerning the subjects' sex, the majority were females; whereas 52 (42%) were males, 72 (58%) of them were females.

Participation was voluntary and took place during regular class time.

Questionnaires were completed with no personal identification to insure anonymity and increase the probability of honest responses.

Measures

To measure writing apprehension, the scale developed by Daly and Miller (1975) was used. This is a 26-item questionnaire that features items with positive polarity and 13 with negative polarity. Scores can range from 26 to 130. Scores below 59 indicate high willingness to write without hesitation. Scores ranging 60 - 96 indicate moderate level of writing apprehension. Scores above 97 indicate high writing apprehension. Participants were asked to indicate how much they agree with statements by marking a number representing their response to each statement using the following the Likert scale - strongly disagree = 1; disagree = 2; neutral = 3; agree = 4; strongly agree = 5.

This inventory was specifically designed to measure self-reported writing apprehension. The test was originally developed with reference to first-language learners, particularly English native speakers.

There have been a few attempts to measure writing apprehension in L2, all of which have used modified versions of the Daly and Miller instrument. (Bruce, Gungle and Taylor, 1989; Masny and Foxall, 1992; Boice, 1993;). Cornwell and McKay (1999) stated that, although on the whole the Daly and Miller Writing apprehension test (WAT) has been shown to be an instrument of satisfactory internal consistency reliability with concurrent and predictive validity, it needs to be adapted in order to be used to study foreign language writing. We adapted the WAT for use with our Croatian EFL students as follows:

First, the WAT was translated from English to Croatian and back-translated to insure accuracy.

Second, translations were compared and necessary changes were made so that all items in the scale were clear to Croatian EFL students. We added to questions the phrase "in English" so as to be clear that we were talking about writing in English not Croatian.

A previous pilot study was carried out with this test and it proved to be suitable for our informants' age and language level. Questionnaire was administered at the beginning of the semester. The time allotted to complete it was 15 minutes during class time. At the beginning of each test, clear instructions were given in the students' mother tongue to clarify what they were being asked to do.

Data analysis

Results from the reports were processed using SPSS (Statistical Package for Social Sciences).

3. RESULTS AND DISCUSSION

This section deals with analysis of data, presentation of results and discussion and interpretation of these results. It attempts to answer the research questions. It also tests whether the hypotheses of the study will be retained or rejected. The statistical test adopted in this study is the t-test independent sample used to show the difference in means between two independent groups. It is worth mentioning, the significance level for these statistical measures was set at the conventional (0.05 and 0.01) levels. Results will be presented and discussed in terms of the study hypotheses.

The participants in our study reported moderate level of writing apprehension. According to Daly Miller (1975) most students who score in this range (scores ranging 60 - 96) do not experience a significantly unusual level of writing apprehension. However, the closer the score to the limits of this range, the more apprehension students are to experience feelings or behaviors characteristic of the next range of scores. Daly Miller (1975) underlined that students should be alert to the fact that they may manifest signs of writing apprehension in performing certain writing tasks or in writing with varying purposes for different types of audiences.

The First Hypothesis:

There are statistically significant differences in writing apprehension due to students' gender.

The researcher assumes that gender is an important factor in the students' estimates of their writing apprehension. Data related were statistically treated using t-test paired sample. The results are summarized in the following tables.

Table 1.: Gender differences in writing apprehension - first year

	Male	Female	t	p
N	52	72		
M	72.36	72.44	.676	n.s.
SD	8.84	8.85		

Source: authors'

Table 2.: Gender differences in writing apprehension - third year

	Male	Female	t	p
N	52	72		
M	73.43	73.22	.988	n.s.
SD	8.59	8.21		

Source: authors'

As can be noticed in Tables 1. and 2., there are no statistically significant differences due to students' gender in their estimates of writing apprehension. Although not at a statistically significant level, the students' apprehension decreased over the semesters.

The results of research on gender differences are not conclusive. Some studies confirmed the existence of gender differences in favor of one of the genders whereas others asserted that gender plays no role in writing apprehension. The findings obtained in the present study are confirmed by some researchers and refuted by others. For instance, Masse and Popvich (2003) and Popvich and Mark (2003) say that there is no evidence that there are differences in apprehension due to gender. Daly (1985 cited in Gungle and Taylor, 1989) has noted that females have significantly lower levels of writing apprehension than their male counterparts because they get more positive teacher reactions to their writing than do males. Nonetheless, Abdul-Fattah (1995) concluded that his female subjects in general and advanced students experienced more writing apprehension than did males and less advanced students. This finding is confirmed by Masny and Foxall (1992) who stated that their data indicated that female subjects were more apprehensive than males. The results of the current study are consistent with those of Daly and Masse and Popvich whereas they contrast those found by Abdul-Fattah and Masny and Foxall.

To sum up, the first hypothesis is refuted since no statistically significant differences occurred between male and female students' estimates of writing apprehension.

The Second Hypothesis:

There are statistically significant differences in writing apprehension due to students' academic level (age).

Table 3.: Academic level difference in writing apprehension

	First year	Third year	t	p
N	124	124		
M	77.12	73.51	-2,58	0,05
SD	10.43	8.80		

Source: authors'

Table 3. shows the t-test analysis results used to assess changes that occurred in the means of the variables assessed in the first and in the third year. T-value indicates that a statistically significant difference occurred between first and third year students in their estimates of writing apprehension: $F(124) = -2,58, p < 0,05$) The third year students reported higher willingness to write.

Accordingly, the second hypothesis is confirmed.

We believe that in our case the level of writing apprehension was reduced because we applied measures of reducing writing apprehension during the EFL classes. We followed strategies proposed by researchers for handling writing apprehension. These are the follows:

- give students writing assignments that are not graded. Such as exploratory writing on a topic, and rough drafts of essay (Clark, 2005)
- identifying error patterns students make and helping student-writers correct these errors rather than correcting every single mistake by the teacher is a widely accepted technique in overcoming high levels of writing apprehension among students. (Bernstein, 1978; Wachholz and Etheridge, 1996; Reeves, 1997).
- resorting to peer feedback as a substitute for teacher feedback when it works (Krause, 2001; Borich, 2004; Kurk and Atay, 2007)
- countering negative experiences by actively creating positive ones (Sommers, 2006; Rankin-Brown, 2006).
- encouraging students to write more and to celebrate their success (Adolphs and Schmitt, 2004; Staehr, 2008)

4. CONCLUSION

The phenomenon of writing apprehension has received much scholarly effort because of the importance assigned to it by many educators and writing specialists. Apprehension about writing is a common condition on colleges. Because writing is the most common mean of sharing knowledge, students put a lot of pressure on themselves when they write. As noted by Celce-Mercia (1991), expressing one's ideas in written form in a second or foreign language, and doing so with reasonable accuracy and coherence, is a major achievement.

This study was undertaken to examine Croatian EFL writing apprehension from the learners' own views. A related purpose was to determine if the variables of students' gender and academic level (age) play a role in their writing apprehension.

Results of the current study show that the participants in our study reported moderate level of writing apprehension. Our findings state that gender plays no effective role in the students' estimates of the causes of writing apprehension. We assume that the causes which make both male and female students anxious when practicing writing are approximately the same.

The data collected for this study demonstrate that there is a statistically significant difference between first and third year students in their estimates of writing apprehension. The difference was in favor of third year students. It is reasonable to speculate that in our case the level of writing apprehension was reduced because during the course of education, students learn to apply writing skills, based on perception, language usage, nonverbal and verbal communication. Emphasis is placed

on effective writing and methods for overcoming barriers to writing. This research could be considered a preliminary investigation on which follow-up work could be based.

Limitations of the Study

Instrumentation of the current study is a questionnaire tackling the area of the study from the students' own perspective. Had other instruments such as observation or interview been used, more reliable results might have been reached.

REFERENCES:

- Abdul-Fattah, H. S., "FL Writing Apprehension of University Students", Mutah Lil-Buhooth Wa Al-Dirasat. Mutah University, 10 (5), (1995)
- Adolphs, S. and Schmitt, N., "Vocabulary coverage according to spoken discourse Context", In Bogaards, P. and Laufer, B., editors, Vocabulary in a Second Language, Amsterdam: John Benjamins, (2004): 39-52
- Bernstein, A., "Errors and Expectations: A guide for the Teacher of Basic Writing by Mina P. Shaughnessy", The School Review, 86 (2), (1978): 292-294
- Boice, R., "Writing Blocks and Tacit Knowledge", The Journal of Higher Education, 63(1), (1993):19-54
- Borich, G. D., Effective Teaching Methods. Fifth Edition, New Jersey, 2004
- Bruce, W., Gungle, B. W. and Taylor, V., "Writing Apprehension and Second Language Writers", In Richness in Writing: Empowering ESL Students' editing: Donna M. Johnson and Duane H. Roen, Longman New York and London, (1989)
- Celce-Mercia, M., Language teaching methodology, London: Prentice Hall, 1991
- Clark, D., "Explorations into Writing Anxiety: Helping Students Overcome their Fears and Focus on Learning", ISSOTL Conference, (2005)
- Daly, J., "Writing Apprehension and Writing Competency", Journal of Education Research, 72 (1), (1978): 10-14
- Daly J. and Miller, M. D., "Apprehension of Writing as A predictor of Message Intensity", The Journal of Psychology, 89, (1975): 173-177
- Dickson, K. J., "Free Writing Prompts and Feedback", The Internet TESL Journal, 7(8), (2001)
- Faigley, L., Daly, J. and Witte, S. T., "The Role of Writing Apprehension in Writing Performance and Competence", Journal of Education Research, 71(1), (1991): 17-20
- Fritzsche, B. A., Youn, B. R. and Hickson, B., "Individual Differences in Academic Procrastination Tendency and Writing Success", Personality and Individual Differences, (2003)
- Grabe, W. and Kaplan, R. B., Theory and Practice of Writing. Longman, London, 1996
- Grundy, D., "Writing Anxiety", The Arts in Psychotherapy, 12, (1985): 151-156
- Gungle, B. and Taylor, V., "Writing Apprehension and Second Language Writers", Edited by Donna, M. Johnson, Richness in Writing. Longman, USA, (1989)
- Hassan, B., "The Relationship of Writing Apprehension and Self-esteem to the Writing Quality and Quantity of EFL University Students", Mansoura Faculty of Education Journal, 39, (2001): 1-36.
- Krause, K. L., "The university Essay Writing. Experience: A pathway for Academic Interaction during Transition", Higher Education Research and Development, 20 (2), (2001): 147-168
- Kurk, G. and Atay, D., "Students' Writing Apprehension", Journal of Theory and Practice in Education, 3(1), (2007): 12-23
- Maria-Rankin, B., "Addressing Writing Apprehension in Adult English Language Learners", CATESOL State Conference, (2006)

- Masse, M. and Popvich, M., "Individual Assessment of Media Writing Student Attitudes: Recasting the Riff and Stacks Writing Apprehension Measure", *Journalism and Mass Communication Quarterly*, 82 (2), (2003): 339 - 355
- Masny, D. and Foxall, J., "Writing Apprehension in L2", Retrieved from: www.eric.gov.ed, (1992)
- Mochizuki, M. and Aizawa, K., "An affix acquisition order for EFL learners: an exploratory study", *System* 28, (2000): 291-304
- Pajares, F., "Self-efficacy beliefs, motivation, and achievement in writing: a review of the literature", *Reading & Writing Quarterly*, 19, (2003): 139-158
- Pajares, F., & Valiente, G., "Gender differences in writing motivation and achievement of middle school students: A function of gender orientation?", *Contemporary Educational Psychology*, 24, (2001): 366-381
- Pajares, F. and Johnson, M. J., "Confidence and competence in writing: The role of self-efficacy outcome expectancy, and apprehension", *Research in the Teaching of English*, 28, (1993): 313-31
- Pérez Basanta, C., "Assessing the receptive vocabulary of Spanish students of English Philology: An empirical investigation", In Martínez-Dueñas, J.L., McLaren, N., Pérez Basanta, C. and Quereda Rodríguez-Navarro, L., editors, *Towards an understanding of the English language: past, present and future*. Granada: Universidad de Granada, (2005): 1-21
- Popvich, M. And Mark, H., "Individual Assessment of Media Writing Student Attitudes: Recastine, the Mass Communication Writing Apprehension Measure", *Journalism and Mass Communication Quarterly*, 82 (2), (2003): 339-355
- Rankin-Brown, M., "Addressing Writing Apprehension in Adult English Language Learners", CATESOL State Conference, (2006)
- Reeves, L. L., "Minimizing Apprehension in the Learner Centered Classroom", *The English journal*, 86, (1997): 38-45
- Sharples, M., (ed.), *Computer supported collaborative writing*, Springer-Verlag, 1993
- Shell, D. F., Colvin, C., and Burning, R. H., "Self-efficacy, attributions and outcome expectancy mechanisms in reading and writing achievement: Grade-level and achievement level differences", *Journal of Educational Psychology*, 87, (1995): 386-398
- Shell, D. F., Murphy, C. C. and Bruning, R. H., "Self-efficacy and outcome expectancy mechanisms in reading and writing achievement", *Journal of Educational Psychology*, 81, (1989): 91-100
- Smith, T. and Renk, K., "Predictors of academic-related stress in college students: An examination of coping, social support, parenting style and anxiety", *National Association of Student Personnel Administrators Journal*, 44 (3), (2007): 405-431
- Sommers, N., "Across the Drafts". *College Composition and Communication*, 58 (2), (2006): 248-257
- Staehr, L.S., "Vocabulary size and the skills of listening, reading and writing", *Language Learning Journal* 36, (2008): 139-52
- Stapa, S. H. and Abul Majid A. H., "The Use of First Language in Developing Ideas in Second Language Write", *European Journal of Social Sciences*, 7 (4), (2009)
- Stolpa, J. M., "Math and Writing Anxiety", *The English Journal*, 77 (2), (2004): 61-62.
- Wachholz, P. and Eitheridge, C., "Speaking for themselves: Writing Self-efficacy Beliefs of High and Low Apprehensive Writers", *Journal of Developmental Education*, 19 (3), (1996)

Yavuz, D. and Genc, A.B., "*Flexibility of setting up a writing unit at YADIM*", Research Study. Çukurova University, Adana, Turkey, (1998)

Webb, S., "Receptive and productive vocabulary sizes of L2 learners", *Studies in Second Language Acquisition* 30, (2008): 79-95

DEVELOPING MARKETING STRATEGY OF POULTRY MEAT SUPPLY IN EU- 28 COUNTRIES: MULTIVARIATE ANALYSIS APPROACH

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ABSTRACT

To create a concept of the marketing strategy, it is necessary to analyse the factors affecting the purchasing decisions of consumers. For the variables: production, import, export, and manufacturer's price we examine their impact on the marketing of poultry meat in the EU-28 in 2009 and 2011. Countries are grouped into clusters, their properties are analysed in relation to the mentioned variables. With multiple regression analysis, we find that there is a statistical correlation between high production and depending on the variable, and between the imports and exports as the independent variables. Based on the analysed data in the researched countries, we conclude that the qualitative development of the production of poultry meat required implementing sophisticated agricultural policy with low inputs prices and exploit all available spare resources.

Keywords:

cluster analysis; correlation; marketing strategy; multiple regression; poultry meat

1. INTRODUCTION

The development of modern technology calls for a continuous adjustment of our skills. Any marketing strategy must take into account contemporary knowledge and the increasingly strict marketing activity requirements enhance our effectiveness in applying the knowledge. While all Member States can significantly increase their sales on accessing the EU market, they also face increased competition. Surviving in such a large market hinges on constantly following novelties and adapting to market conditions in the shortest time possible. A thorough understanding of the market we want to go in is therefore a prerequisite. Databases available online do not provide marketing managers with high-quality analysis of the market. It is, therefore, necessary to carry out a multitude of comparisons between individual EU countries. Only comparisons provide the necessary focus as the outliers, maximums and minimums are deduced (Žugaj, Dumičić and Dušak, 2006) and cropped to detect a country's position within the EU market.

Similarly, as was the turning point of technological development of the industrial revolution at the beginning of the 20th century, was a new turning point with the introduction of the wide use of information and communication technologies (ICT) at the end of the 20th century. In agriculture the industrial revolution brought about the use of artificial fertilizers, at the end of the last century, but began production in agriculture of genetically modified crops for human or animal consumption. Such food has become an integral part of our daily diet. The effects of such diets require long-term studies and therefore, are still pretty unexplored area. Awareness of consumers of poultry meat, due to the use of ICT is very large and therefore, many consumers of all types of meat are already looking for someone who was reared by genetically modified feedingstuffs. Some producers of poultry meat in the markets already offer meat labeled GMO-free. However, the price received by producers for the production (the producer's price) is still one of the important factors that affect the competitive final price of meat on the market. In countries with higher standards is already possible to discern that they are knowledgeable buyers willing to pay a higher price for meat, which has been genetically modified food free reared.

This paper aims to determine the interrelations between production, import, export and producer prices of poultry meat in EU-28. The obtained results could be used by marketing managers to develop export strategies (Klemenčič, Devetak and Števančec, 2012). The most recent available data on the above variables are from 2011 (FAOstat, 2015). The data were collected from national annual reports on production and the Eurostat database (Eurostat, 2015). Furthermore, our objective is to identify country clusters based on population, imports, exports and poultry meat prices. The findings could inform marketing strategies and poultry sales in certain countries.

2. METHODOLOGY

2.1. Data sources

From Faostat database are selected data of Production, Imports and Exports of all European Union state members (EU-28). Because the data are given in the 1.000 kilogram (kg) what is equal to 1 ton (t), we calculated by the unit before carrying out research in kg per capita, therefore, from the same base we select the data on the population of each country. Information on the producer's price are also picked from the same database Faostat, but in a survey in the base unit of US \$/t. FAOstat Division works directly with countries to develop their national statistical strategy, and advise on the improvement and development of their statistical programs. This information tells you that the data in the Member States of the UN are gathered from Faostat, so they use the same highly professional statistical methods. All Member States of the UNITED NATIONS in making the data must strictly respect the principles of the Paris Declaration on Aid Effectiveness, the Accra Agenda for Action, and the Dakar and Busan Declarations (2015).

It should be noted that data for Croatia, which joined the EU only in July 2013, are not published, so the data for Croatia were calculated by interpolation of the data published for Slovenia, because these two countries have very similar characteristics.

2.2. Application of statistical cluster analysis

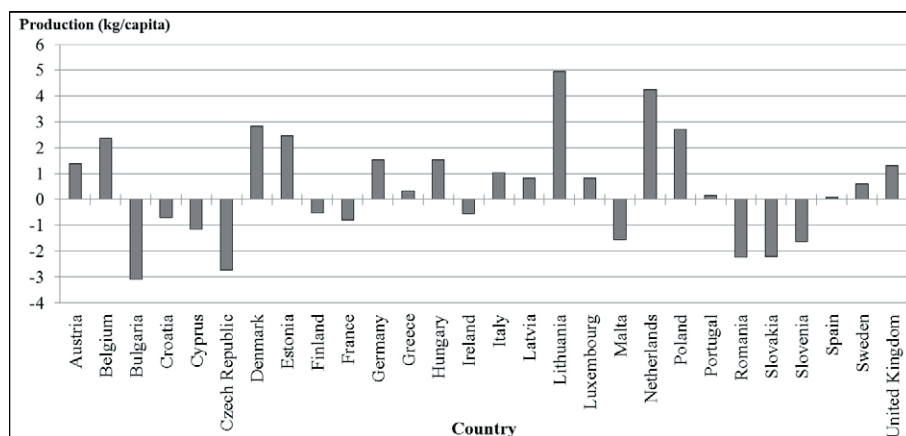
Modern marketing research relies on the data collected by professional international agencies. In this research study, the data collected by FAOstat (2015), Eurostat (2015) and CIA World Factbook (2015) were analyzed using regression and cluster analysis. Wong (2009) used cluster analysis to study business opportunities and came to the conclusion that clustering could help in developing new marketing strategies. Simonič, Dumičić and Devetak (2012) used regression modelling to describe test for predicting poultry meat supply in European countries. They found a six-cluster solution when testing their research hypothesis that country clusters can be identified using four variables on poultry meat (production, exports, imports per capita, and producer price per quantity unit) provided that the variables are standardized and that Ward's linkage method and Euclidean distances are used.

2.3. Food supply trends

The global economic stagnation, including all EU member states (EU-28), led to a pronounced rise in unemployment. Providing food is becoming an increasingly important task for all EU member states. Although GMO-based feed has not as yet been well studied, producers are using genetically modified organisms (GMOs) in

an attempt to increase grain yield per area unit (ha) and achieve long-term solutions (Hall, 2010). The Figure 1. reveals that 17 countries have increased the production of classic poultry in the period from 2009 to 2011. In period from 2009 to 2011 the highest increase in production of poultry meat per capita achieved Lithuania (+4.96 kg/capita) whilst the highest decrease in poultry meat production had Bulgaria (-3.09 kg/capita) in the same period. Both, Croatia and Slovenia decreased their poultry meat production per capita in 2011 in compare to the production from 2009.

Figure 1.: Bar chart of differences in production of poultry meat in kg/capita in EU-28 countries between 2009 and 2011



Source: Author's.

Table 1. presents the results of descriptive statistics for selected variables in 2009 and 2011. In 2011, it has been produced, on average, 22.14 kg per capita, which is 0.43 kg/capita more in compare to 2009. Compared to 2009, in 2011, the standard deviation increased 0.88 kg/capita, while the coefficient of variation increased from 51% to 54%. Poultry meat production data distributions are positively skewed in both observed years.

On average, imports of poultry meat in the year 2011 amounted to 10.48 kg/capita (in 2009 amounted to an average of 9.04 kg/capita) while the standard deviation was 7.82 kg/capita and 76% the coefficient of variation, which suggests that the variability was 2% lower than in 2009. Frequency distribution is a positive (skewness = 1.76) and peak is slightly sharper compared to normal distribution (kurtosis = 4.59). The biggest importer among the researches countries is the Netherlands with 38.58 kg/capita what is 3.10 kg/capita more in 2011 than in the 2009.

Table 1.: Results of descriptive statistics for variables: production, import, export & producer price of poultry meat for EU-28 in 2009 and 2011

Statistics	Production (kg/capita)		Import Quantity (kg/capita)		Export Quantity (kg/capita)		Producer Price (US \$/t)	
	2009	2011	2009	2011	2009	2011	2009	2011
Number of countries	28	28	28	28	28	28	28	28
Mean	21.72	22.14	9.04	10.48	8.26	10.48	1,994.13	2,131.81
Minimum	2.89	3.72	0.88	1.01	0.00	0.10	1,015.00	1,008.28
Maximum	50.72	54.96	35.48	38.58	61.52	76.76	5,722.20	6,337.10
Range	47.83	51.24	34.60	37.57	61.52	76.66	4,707.20	5,328.83
Population standard deviation	10.84	11.72	6.89	7.82	12.85	15.52	881.97	935.50
Skewness	0.81	0.99	2.12	1.76	3.14	3.26	2.95	3.47
Kurtosis	0.65	0.96	6.57	4.59	10.69	11.94	10.88	14.55
Coefficient of variation (CV)	0.51	0.54	0.78	0.76	1.58	1.51	0.45	0.45
1st quartile	13.35	13.21	5.07	5.07	1.83	2.32	1,543.33	1,731.97
Median	19.33	19.40	7.69	9.22	3.54	5.06	1,685.60	1,830.04
3rd quartile	27.25	26.80	11.20	13.31	8.75	10.87	1,998.60	2,182.97
Interquartile range	13.91	13.59	6.13	8.23	6.93	8.55	455.28	451.00

Source: Author's.

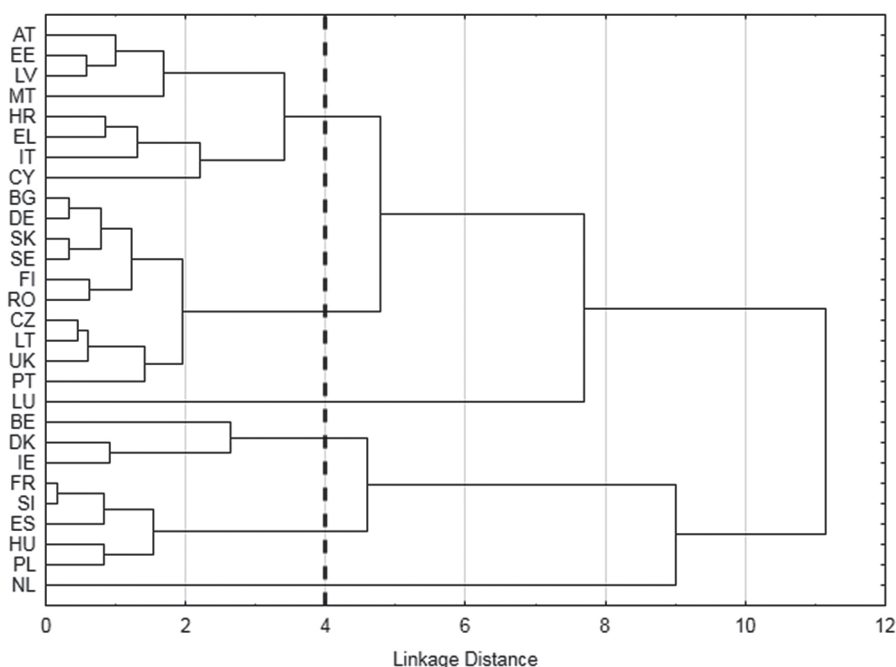
In 2011 the average export volume was 10.48 kg/capita, which is for 2.22 kg/capita more than in 2009 and with an average deviation from the mean of 15.52 kg/capita, or relatively 20.8% in terms of relative standard deviation showing the decline of the variability in poultry meat export per capita for 4.5% relative to 2009. The analyzed data of export are still quite far from a stable, normal distribution that is positively skewed (skewness=3.26). The Netherlands extremely increased its export at 76.76 kg/capita and still represents a serious outlier. Such a growth could be explained with the accession of new countries to the European Union, which do not have the borders, thus enabling the import of poultry meat under much lower prices.

The average poultry meat price in 2011 was 2,131.81 US \$/t, which represents a 6.8% increase on the average price in 2009. The data for different countries varied considerably. Compared to 2009, the distribution of producer prices in 2011 was less skewed (skewness = 3.47), but was still far from the normal distribution. The highest price of 6,337 US\$/t was recorded in Luxemburg. Producer prices in Italy decreased from 2,732 US \$/t in 2009 to 2,278 US \$/t in 2011. This drop in the price of poultry meat could be explained by the enlargement of the common market: the increased supply of poultry meat and the (lower) GDP of new member states.

3. Cluster analysis of all European Union member states (EU-28 regarding the poultry meat supply data in 2009 and in 2011

The first research hypothesis (H₁) is EU-28 countries can be clustered into distinct groups on the basis of four variables related to poultry meat: production, exports and imports per capita, as well as producer price of poultry meat per quantity unit. Cluster analysis was therefore performed using standardised data, Ward's linkage method and Euclidean distances (Dumičić, Čeh Časni, Žmuk, 2015, Žmuk, 2015).

Figure 2.: Dendrogram of EU-28 countries based on four variables: production (kg/capita), export (kg/capita), import (kg/capita) and price (US \$/t) of poultry meat, 2009



Source: Author's.

The Cluster 1 is comprised of 8 countries with exceptionally small amount of production, import and export, as well as with low producer prices of poultry meat. The exception in this cluster is Austria, where State with its agrarian policy pays farmers a subsidy and so keeps a low producer's price. These countries are: Austria, Croatia, Cyprus, Estonia, Greece, Italy, Latvia, and Malta.

The Cluster 2 consists of 10 countries: Bulgaria, Czech Republic, Finland, Germany, Lithuania, Portugal, Romania, Slovakia, Sweden, and United Kingdom. On

average, these countries have similar values of production, import, export and prices – all variables are in mutual harmony. They have small standard deviations, which is also one of the common factors that connect these countries.

The Cluster 3 is made of 1 country: Luxembourg is characterized as the low poultry meat producer, while producing only 229,000 t/year i.e. 2.89 kg/capita of poultry meat, thus holding the last place in Europe. Luxembourg has a high population density (185.6 people per km²) but also does not have its own production, while export and import are far below the average in a relation to other European countries. However, this country has the highest producer prices of poultry meat in Europe of 5,722.2 US\$/t which is 400% above the European average. The reason for the highest price in Luxembourg can be explained by the types of meat that this country imports and exports. The import consists mainly of the most expensive parts, that is, from chicken fillets, which have up to 3 times higher price than other parts of the chicken.

In Cluster 4 there are Belgium, Denmark and Ireland. These countries have connections between two pairs of economic features and dependent variables. The first pair is presented by the production and producer prices. The countries in this Cluster are diametrical opposites. They have relatively high poultry meat production, while on the other hand the producer prices are low. The second feature of these countries is a positive difference of lower import and higher export (export surplus). This diametrical opposite provides them a competitive advantage and the possibility for higher GDP as well as the background for new investments and the industrial development.

Cluster 5 includes France, Hungary, Poland, Slovenia and Spain. The interaction within the cluster reveals that Slovenia and France coincide in all four variables. Hungary and Poland deviate from the cluster average with a lower producer price and higher production per capita. Spain differs from the average in terms of lower import and lower export quantities. Countries in this cluster have similar average values, but their marketing strategies should be designed taking into consideration the under-clusters, as shown in Figure 2.

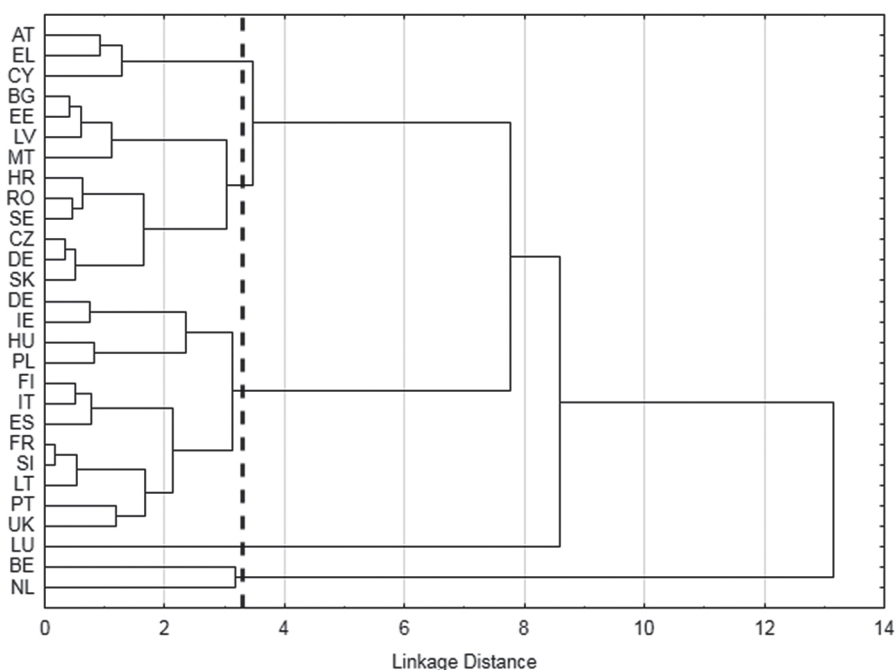
Finally, Cluster 6 consists of only one country, the Netherlands. It is on the first place per production quantities with 50.72 kg/capita, but noted that EU legislation allows specifying each country as the producer of the poultry meat production, which implements the final packaging of the products. That leaves the possibility that the Netherlands is listed as the producer, even though he only pre-package the imported goods. It is also a logical explanation for the high import and export of these relatively small European countries with 16.6 million inhabitants. Compared to other European countries, the exports of poultry meat from the Netherlands were 713.7 % above the average of EU (8.62 kg/capita). The export quantities from Netherlands are equal to export of Belgium and Denmark which are placed second and third, respectively, in terms of the quantity of poultry meat exported.

Further, clustering is made for the same variables and the same countries for 2011. In Figure 3. the clusters of EU-28 countries according to conducted cluster

analysis results based on standardized variable values, Ward's method and Euclidean distances the are given.

In 2011 Cluster 1 was comprised of 3 countries only: Austria, Cyprus and Greece. Croatia, Estonia, Latvia and Malta moved to cluster 2, while Italy moved to cluster 3 due to a pronounced fall in producer prices. Countries in cluster 1 were characterized by a relatively low domestic production of poultry meat. Consequently, with imports significantly higher than exports of poultry meat, they were import-oriented. The trade deficit (export - import = deficit) in poultry meat was negative and amounted for Austria -3.94 kg/capita, for Cyprus -4.02 kg/capita and for Greece -8.18 kg/capita, respectively.

Figure 3.: Dendrogram of EU-28 countries based on four variables: production (kg/capita), export (kg/capita), import (kg/capita) and price (US \$/t) of poultry meat, 2011



Source: Author's.

Cluster 2 was made of 10 countries in 2009. Bulgaria, the Czech Republic, Germany, Romania, Slovakia and Sweden maintained their place in cluster 2 and were joined by Croatia, Estonia, Latvia and Malta from cluster 1 in 2011. Simultaneously, Finland, Lithuania, Portugal and the United Kingdom moved to cluster 3 in 2011. Cluster 2 countries were jointly characterized by a low production of poultry meat per capita, which was below under average of the annual EU-28 production quantities of 22.14 kg/capita in 2011. Even though these countries export poultry meat, they are

mostly import-oriented and have a huge export deficit in products obtained from poultry meat.

Cluster 3 included 12 countries: Denmark, Finland, France, Hungary, Ireland, Italy, Poland, Portugal, Lithuania, Slovenia, Spain and the United Kingdom. These countries are characterized by a high production of poultry meat per capita, i.e. their production was above average of the annual EU-28 production quantities of 22.14 kg/capita in the year 2011. These countries also export more than they import and consequently have a big export surplus in products obtained from poultry meat. These countries are export-oriented.

There was only one country in cluster 4: Luxembourg, which was one of the three outliers. In 2011 this cluster was characterized by the lowest domestic production, amounting to barely 3.72 kg/capita, the third-largest volume of imports (22.71 kg/capita) and the highest producer price of poultry meat (6,337 US \$/t). Poultry meat exports of Luxembourg were very small, amounting to only 2.27 kg/capita, which was far from the average of the EU-28 of 10.48 kg/capita. In 2011, Luxembourg had the largest export deficit in EU-28 of -20.44 kg/capita. This country is import-oriented.

Cluster 5 included Belgium and the Netherlands. In comparison with other EU-28 states, Belgium had the second highest production volume (46.36 kg/capita), the third highest import volume (20.44 kg/capita) and the second highest export volume (43.80 kg/capita). The Belgian production was higher for 24.22 kg/capita than the average production in EU Member States-28 (22.14 kg/capita). Export was greater for 33.32 kg/capita than the value of the exports average of the EU-28 (10.48 kg/capita). The average producer price of poultry meat of countries in the cluster is 1,786 US \$/t which is for 345 US \$/t lower than the average producer price in all 28 EU member states (2,131 US \$/t). The Netherlands had the largest production of poultry meat in the EU-28 (54.96 kg/capita), the highest import volume (38.58 kg/capita), the highest export volume (76.76 kg/capita) and production price among the lowest in the EU (1,684 US \$/t): as much as 447 US \$/t lower than the average of the EU-28. Compared to the rest of the EU-28, the Netherlands recorded the largest difference between imports and exports of products obtained from poultry meat. Its trade surplus in poultry meat was 38.19 kg/capita. High export volumes can be attributed to the relatively low price. That is to say, the most upmarket of the imported goods (mainly chicken fillet) reaches the EU market at the lowest prices through the Netherlands' biggest shipping ports (Rotterdam and Amsterdam). These two countries are both export-oriented.

From 2009 to 2011, 22 countries were within Clusters 2 and 3, which represented 78.5% of the all European Union state members (EU-28). It seems highly probable that a single variable affected the results for the majority of EU-28 as in 2011 the countries were most evenly spread than in 2009. This unification may logically be explained by the openness of the EU market.

4. CORRELATION AND MULTIPLE REGRESSION ANALYSIS OF ALL EUROPEAN UNION MEMBER STATES (EU-28) REGARDING THE POULTRY MEAT SUPPLY DATA IN 2009 AND IN 2011

Correlation matrix consists of the coefficients of linear correlation between variables of production, import, export and producer price of poultry meat. The correlation matrix based on data from 2009 is given in Table 2. whereas the correlation matrix based on data from 2011 is presented in Table 3.

Table 2.: Correlation matrix of variables production, import, export and producer price of poultry meat, EU-28 countries, 2009

	Production (kg/capita)	Import (kg/capita)	Export (kg/ capita)	Producer price (US\$/t)
Production (kg/capita)	1.0000			
Import (kg/capita)	0.2724	1.0000		
Export (kg/capita)	0.7831**	0.7072**	1.0000	
Producer price (US\$/t)	-0.4480*	0.0868	-0.2584	1.0000

* - correlation is significant at the 0.05 level (2-tailed)

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

Source: Author's.

Table 3.: Correlation matrix of variables production, import, export and producer price of poultry meat, EU-28 countries, 2011

	Production (kg/capita)	Import (kg/capita)	Export (kg/ capita)	Producer price (US\$/t)
Production (kg/capita)	1.0000			
Import (kg/capita)	0.2957	1.0000		
Export (kg/capita)	0.8061**	0.7055**	1.0000	
Producer price (US\$/t)	-0.3833*	0.1837	-0.2038	1.0000

* - correlation is significant at the 0.05 level (2-tailed)

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

Source: Author's.

Correlation coefficients show that positive linear correlation exists between variables Production, Import and Export considered for 2009 and 2011. Variables Production and Export are highly positively correlated with correlation of $r=0.7831$ in 2009 and $r=0.8061$ in 2011. Variables Import and Export are moderately positively correlated in 2009 and in 2011 ($r_{2009}=0.7072$, $r_{2011}=0.7055$). On the other side, variable Producer price is negatively correlated with variable Production in both

observed years. So, variable Producer price is moderately negatively correlated with variable Production ($r_{2009} = -0.4480$, $r_{2011} = -0.3833$). All mentioned correlations seem to be statistically significant at significance level 5%.

With a purpose to test the second research hypotheses H2, that there is at least one variable that is statistically significant for an explanation of poultry meat production in kg/capita, the multiple linear regression analysis was conducted (Dumičić, Žmuk and Palić, 2014). In the model variable Production of poultry meat in kg/capita is a dependent variable whereas the other variables are considered as independent (Import of poultry meat in kg/capita, Export of poultry meat in kg/capita, Producer price in US\$/t). The best statistical properties and results were shown when variables Import and Export were included in the regression model as independent variables. It has to be emphasized that variable Producer price in US\$/t has statistically significant correlation with variable Production of poultry meat in kg/capita but that independent variable come is not statistically significant in the multiple regression models. Consequently, following multiple linear regression model for the population is analyzed in detail:

$$\text{Production}_i = \beta_0 + \beta_1 \cdot \text{Import}_i + \beta_2 \cdot \text{Export}_i + e_i, \quad i = 1, 2, \dots, n \quad (1)$$

Furthermore, appropriate model for the sample in this case is:

$$\widehat{\text{Production}}_i = \hat{\beta}_0 + \hat{\beta}_1 \cdot \text{Import}_i + \hat{\beta}_2 \cdot \text{Export}_i, \quad i = 1, 2, \dots, 28 \quad (2)$$

Estimates are calculated using an ordinary least squares method (OLS) for 2009 and 2011. In order to estimate multiple regression models data for all European Union state members (EU-28) were used.

$$\begin{aligned} \widehat{\text{Production}}_i &= 21.4967 - 0.8855 \cdot \text{Import}_i + 0.9964 \cdot \text{Export}_i \\ &\quad (1.7600) \quad (0.2127) \quad (0.1140) \\ R^2 &= 0.7716 \quad \bar{R}^2 = 0.7534 \quad R = 0.8784 \\ \hat{\sigma} &= 5.48 \quad \hat{V} = 25.25\% \quad DW = 2.397 \quad n = 28 \end{aligned} \quad (3)$$

Appropriate regression diagnostic was conducted and it was concluded that all multiple regression model assumptions are fulfilled. So, the multicollinearity test using Variance Inflation Factor (VIF) criteria showed that VIF statistic is 2.000 what is considerably lower than 5. Consequently, it has been concluded that there is no multicollinearity problem in the model. Next it was tested if the residual variance in a regression model is constant or not. Both conducted tests, Breusch-Pagan-Godfrey (test statistic = 2.584, p-value = 0.2747) and White (test statistic = 4.414, p-value = 0.4915) tests, have shown that it can be concluded that, at significance level 5%, the residual variance in a regression model is constant. The existence of significant

correlation between error terms ordered in time was inspected using Durbin-Watson and Ljung-Box test. Since the test value for Durbin Watson test is $DW = 2.397$, so that $2 < DW < 4$, the test for negative autocorrelation of residuals was conducted. The computed DW is smaller than the table value $4 - d_u = 2.441$ at significance level 5%, so the test indicates that there is no negative autocorrelation of the first order. In addition, Ljung-Box test showed that there is no autocorrelation of residuals up to the 12th order at significance level 5%. The Jarque-Bera test of normality (test statistic = 0.580, p-value = 0.7483) for residuals was applied. The test has shown that the null-hypotheses that the residuals are normally distributed may not be rejected at significance level of 5%.

The coefficient of determination, $R^2 = 0.7716$, means that 77.16% of the variation in Production of poultry meat is explained by both Import and Export of the same kind of meat. Consequently, the coefficient of correlation, $R = 0.8784$, is considerably high what goes in favour of conclusion that there is a strong relation between Production of poultry meat on the one side and Import and Export of poultry meat on the other side. The conducted F-test (test statistic = 42.233, p-value < 0.0001) showed that the model in general is statistically significant at significance level of 1%. The regression standard error is 5.48 kg/capita and regression coefficient of variation is 25.25%, meaning the model is representative.

The regression coefficient of the regressor variable Import is negative but statistically significant at significance level of 1% (t-statistic = -4.164, p-value = 0.0003). So, based on the estimated equation, remaining Export unchanged, a one unit increase in Import (kg/capita) decreases Production of poultry meat on average by 0.8855 kg/capita. The regression coefficient of the regressor variable Export is positive and statistically significant at significance level of 1% (t-statistic = 8.737, p-value < 0.0001). So, based on the estimated equation, remaining Import unchanged, a one unit increase in Export (kg/capita) increases Production of poultry meat on average by 0.9964 kg/capita. The standardized parameters of variables Import ($\beta\text{-hat}_1^* = -0.5629$) and Export ($\beta\text{-hat}_2^* = 1.1812$) show that variable Import has lower relative impact on variable Production of poultry meat than variable Export.

Multiple regression model with estimated parameters for the year 2011 is following:

$$\begin{aligned} \widehat{\text{Production}}_i &= 21.2531 - 0.8140 \cdot \text{Import}_i + 0.8984 \cdot \text{Export}_i \\ &\quad (1.8055) \quad (0.1899) \quad (0.0958) \end{aligned} \quad (4)$$

$$\begin{aligned} R^2 &= 0.7981 & \bar{R}^2 &= 0.7819 & R &= 0.8934 \\ \hat{\sigma} &= 5.57 & \hat{V} &= 25.17\% & DW &= 2.544 & n &= 28 \end{aligned}$$

The conducted detailed regression diagnostic showed that the regression model met all requirements. The multicollinearity test using Variance Inflation Factor (VIF statistic = 1.991) showed that independent variables are not highly correlated and so their separate influence on the dependent variable can be easily distinguished. The

conducted heteroskedasticity test, Breusch-Pagan-Godfrey (test statistic = 1.774, p-value = 0.4118) and White (test statistic = 5.955, p-value = 0.3106) tests, have shown that it can be concluded that, at significance level 5%, the residual variance in a regression model is constant and that the heteroskedasticity problem is not present in the model. The Durbin-Watson test was used to inspect the existence of significant correlation between error terms ordered in time. Since the test value for Durbin Watson test is $DW = 2.544$, so that $2 < DW < 4$, the test for negative autocorrelation of residuals was conducted. The Durbin-Watson test statistic is smaller than the table value $4 - d_U = 2.675$ at significance level 1%, so the test indicates that there is no negative autocorrelation of the first order. The Ljung-Box test results have also pointed out that there is no autocorrelation problem in the model at significance level 5%. According to the Jarque-Bera test of normality results (test statistic = 0.153, p-value = 0.9266) it can be concluded that the residuals are normally distributed at significance level of 5%.

The regression model successfully explained 79.81% ($R^2 = 0.7981$) of the variation in Production of poultry meat by variables Import and Export of the same kind of meat. The coefficient of correlation ($R = 0.8934$) reveals strong correlation between Production of poultry meat on the one side and Import and Export of poultry meat on the other side. The overall F-test of significance of the multiple regression (test statistic = 49.406, p-value < 0.0001) indicates that two independent variables Import and Export together are statistically significant for explanation of Production of poultry meat per capita in EU-28 countries. The regression standard error is 5.48 kg/capita and regression coefficient of variation is 25.25%, meaning the model is representative.

The regression coefficient of the regressor variable Import is negative but statistically significant at significance level of 1% (t-statistic = -4.286, p-value = 0.0002). So, based on the estimated equation, remaining Export unchanged, a one unit increase in Import (kg/capita) decreases Production of poultry meat on average by 0.8140 kg/capita. The regression coefficient of the regressor variable Export is positive and statistically significant at significance level of 1% (t-statistic = 9.380, p-value < 0.0001). So, based on the estimated equation, remaining Import unchanged, a one unit increase in Export (kg/capita) increases Production of poultry meat on average by 0.8984 kg/capita. The standardized parameters of variables Import ($\beta\text{-hat}_1^* = -0.5434$) and Export ($\beta\text{-hat}_2^* = 1.1894$) show that variable Import has lower relative impact on variable Production of poultry meat than variable Export.

5. CONCLUSION

In this study selected multivariate analysis methods were used to explore developing marketing strategy of poultry meat supply in the EU state members (EU-28). In the analysis following variables were used: production, import and export, expressed in units of kg/capita and the producer's price expressed in the unit of US \$/t. For an overview of market potentials we studied the relationships between these variables of selected countries.

In the first part of the research EU-28 countries are clustered into distinct groups on the basis of four variables related to poultry meat: production, exports and imports per capita, as well as producer price of poultry meat per quantity unit in 2009 and 2011. In the hierarchical cluster analysis approach Ward linkage method and the Euclidean distance were used.

In 2011 the Cluster 1 is comprised of 3 countries, as follows: Austria, Cyprus and Greece. Cluster 2 is consisted of 10 countries, which are similar considering clustering variable, and these are: Bulgaria, Croatia, Czech Republic, Estonia, Germany, Latvia, Malta, Romania, Slovakia und Sweden. Cluster 3 is made by 12 countries: Denmark, Finland, France, Hungary, Ireland, Italy, Lithuania, Poland, Portugal, Slovenia, Spain, the United Kingdom. Cluster 4 is consisted of 1 country: Luxembourg. A Cluster 5 covers 1 country: Belgium. And, finally, there is Cluster 6, which includes 1 country and that one is The Netherlands. Countries comprising one cluster have similar characteristics considering all four variables on poultry meat, so, the research hypothesis H1 can be accepted.

In the year 2011, it was half of the European Union state members (EU-28) export-oriented. These have been members of the clusters three, five and six. Because of awareness of the growing demand for poultry meat these countries have large investments to expanse theirs production of meat. As indicated by Eurostat (Eurostat, 2014) the price of agricultural industrial crops for the period 2010 to 2014 increased by 6%, while the price of the crops increased by only 4.3% (the same period). The logical explanation is the increased supply of quality meat reared to higher standards (IFS, BRC, STS, BTS), which achieved a higher price in the market, so it is realistic to expect in the future to growth of prices of poultry meat. However, the EU market is becoming increasingly difficult because customers are ever more informed and buy only products that are safe and provide adequate quality.

Analysis of the data showed that the Member States are referred to cluster 2 as an import oriented countries with high export deficit the most important potential customers for the producer's of cluster 3, which are export-oriented and have a large export surplus. With a good marketing strategy for the country from a cluster of 3 as possible buyers of the interesting countries are from cluster 1, which primarily are attractive due to its country size and high producer prices and, consequently, as well as the market price. The Member States referred to in clusters 4, 5 and 6 (Luxem-

burg, Belgium and the Netherlands) are atypical. Doing business with them is harder, because the same operating outside EU borders in poultry meat. In particular, they focused on imports large quantities from South America and recently in China, where imported products with lower price and quality of the goods.

In order to inspect the second research hypothesis (H₂), which states that at least one variable is statistically significant for explaining poultry meat production per capita, a multiple regression model was created for each of the two years considered, 2009 and 2011. A comparison of the two multiple regression models based on two regressors, Exports and Imports in EU-28 countries, revealed that both models are of satisfactory quality. In both multiple regression models the variable Imports has a negative individual impact on Production of poultry meat whereas the variable Exports has a positive impact. Considering the differences in the impact of variables Imports and Exports in 2009 and 2011, it can be concluded that was no significant change occurred. It has, however, been shown that the variable Imports had a lower relative impact on the variable Production of poultry meat than the variable Exports in both years.

Both regression models confirmed the second research hypothesis (H₂) which leads to the conclusion that the production of poultry meat depends on the agricultural policy of individual countries and their investment in agriculture development. Due to the high transport costs of animal feed are also very important location of countries (ports, large agricultural areas for the production of their own feed, low price of labor). Both regression models have got all model assumptions fulfilled, so, they may be used for predictions.

As the main limitation of the research the used old data can be considered. Unfortunately, this was unavoidable because the Faostat database is not regularly updated and there is huge lag between present year and the last year for which data are available.

REFERENCES:

- Bamiro, O.M., Momoh, S. and Phillip D.O.A., "Vertical integration and Profitability in Poultry Industry", available at: <http://www.krepublishers.com/02-Journals/JHE/JHE-27-0-000-09-Web/JHE-27-2-000-09-Abst-PDF/JHE-27-02-149-09-1834-Bamiro-O-M/JHE-27-02-149-09-1834-Bamiro-O-M-Tt.pdf>, (2009)
- CIA, "World Factbook", available at: <https://www.cia.gov/library/publications/the-world-factbook/geos/gm.html>, (2015)
- Dumičić, K., Čeh Časni, A. and Žmuk, B., "Internet Purchases by Individuals: Clusters of the Most vs the Least Developed European Countries", International Journal of Information Technology & Computer Science, Vol. (18), (2015): 1-9
- Dumičić, K., Žmuk, B. and Palić, I., "Web Page Use by Enterprises in European Union: Multiple Regression Analysis Approach", Journal of American Business Review, Vol. (2), (2014): 180-186
- Eurostat, "Projected old-age dependency ratio", available at: <http://epp.eurostat.ec.europa.eu/tgm/graph.do?tab=graph&plugin=1&language=en&pcode=tsdde511&toolbox=type>, (2015)
- Eurostat, "Agricultural accounts and prices", available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Agricultural_accounts_and_prices#Price_indices, (2015)
- FAOstat. „Guiding Principles of the FAO Statistics Division”, available at: http://www.fao.org/fileadmin/templates/ess/documents/Media_and_Communication/Brochures/ESS_vision.pdf, (2015)
- Hall, C.R., "Genetically modified food and crops: perception of risk". available at: <http://hdl.handle.net/1842/4719>, (2010)
- Klemenčič, B., Devetak, G. and Števančec, D., "Intercultural differences in the purchase and information behavior of young consumers", Organizacija, Vol. (45), No. (1), (2012): 14-23
- Simonić, M., Dumičić, K., Devetak, G., "Regression Analysis of Variables Describing Poultry Meat Supply in European Countries", Organizacija, Vol. (45), No. 6, (2012): 289-299
- Vida, I., Kos Koklič, M. and Kunz, M. B., "A study of counterfeiting purchase behavior: the role of perceived consequences and neutralization", (Chicago, Marketing Management Association, 2012)
- Vukasović, T., "Consumer perception of poultry meat and the importance of country of origin in a purchase making process", World's Poultry Science Journal, Vol. (65), (2009): 65-74
- Wong, A. W., "Cluster building by policy design: a sociotechnical constituency study of information communication technology (ICT) industries in Scotland and Hong Kong", available at: <http://hdl.handle.net/1842/4091>, (2009)
- Žmuk, B., "Selling Online by European Enterprises - Multivariate Analysis Approach", International Journal of Engineering Business Management, Vol. (7), (2015): 1-8
- Žugaj, M., Dumičić, K. and Dušak, V., "Temelji znanstvenoistraživačkog rada: Metodologija i metodika", (Varaždin, Sveučilište u Zagrebu, Fakultet organizacije i informatike, 2006)

THE LINK BETWEEN STUDENTS' SATISFACTION WITH FACULTY, OVERALL STUDENTS' SATISFACTION WITH STUDENT LIFE AND STUDENT PERFORMANCES

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ABSTRACT

Customer satisfaction has long been recognized as a central concept of all business activities. Satisfaction can serve as an indicator of success of the company, both in the past and present, as well as an indicator of future performance. High quality service to students is a prerequisite of maintaining competitiveness in the market of higher education. A relationship that is created between the expectations of students and their satisfaction with the quality of service that provides educational institution plays an important role in shaping the reputation of academic institutions. Academic institutions are becoming aware of the importance of student satisfaction, because satisfaction positively influences their decision to continue their education at this institution, and the positive word of mouth that will attract prospective students. Satisfaction will affect student motivation, and therefore their performance. This paper provides insight into the marketing aspects of customer satisfaction, primarily insight into the satisfaction of students in the educational sector. The aim is to establish the influence of satisfaction various factors related to the university and higher education to the satisfaction of student life, and does student life satisfaction affect the overall happiness and student performance. The research was conducted on the student population of the University of Split, on a sample of 191 respondents. The research was conducted with the help of online survey questionnaire. The claim that student's satisfactions with housing affect the satisfaction with the quality of student life is rejected. The results confirmed that the student's satisfaction with university contents, university bodies and services, teaching, teaching methods and academic reputation affects the satisfaction of student life and student life satisfaction affect the student performance.

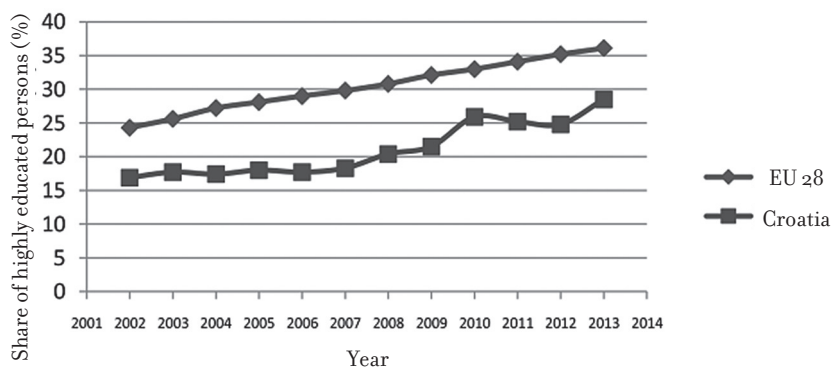
Keywords:

higher education; satisfaction with the student life; student performance; Croatia

1. INTRODUCTION

Many authors have elaborated the subject of students' satisfaction and overall life satisfaction in order to determine if there was a connection between the students' personal satisfaction and the achieved success during studying and to establish what causes student satisfaction. An established system for quality assurance is the fundamental requirement for the creation of an integrated European higher education area, recognition of diplomas, and mobility of people within the European labour area (Budak, Slijepčević, Švaljek, 2009). The basis for establishing and implementing quality assurance in the Republic of Croatia is the Bologna Declaration, while the Standards and Guidelines for Quality Assurance in the European Higher Education Area represent the fundamental document in this context. The five key elements that should be contained in all the national quality assurance systems have been set out by the Berlin Communiqué, and these refer to: internal evaluation, external evaluation, involvement of students, publication of results, and international participation (Lučin, 2007). The development of the higher education quality assurance has considerably moved forward, and several major turning points have been made in terms of cooperation between the European countries (Eurostat, 2012). In the period from 2001 to 2014, the share of the highly educated in the age group of 25 to 35 years was examined. The figures on the highly educated collected from the 28 European Union countries were compared to those obtained in the Republic of Croatia. The European Union countries recorded a constant growth in the number of the highly educated, while the Republic of Croatia recorded an increase before 2010, followed by stagnation until 2012, and re-increase in the period from 2012 to 2014 (Eurostat, 2012.). Students across the European higher education system study in different economic conditions, which need to be borne in mind during all the European discussions on the issue of student mobility and graduation (Šćukanec, 2010).

Figure 1.: Comparison of highly educated people in the age group of 25 to 35 years in the European Union and the Republic of Croatia



Source: <http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/theme>

From all of the above stated, the importance of students' satisfaction with the quality of student life can also be surmised, which represents a broad term that covers a number of variables pursuant to which the conclusions are made on whether the students are pleased with the quality of life at a particular faculty. Numerous authors have looked into the subject of students' satisfaction, which directly binds the notion of the quality of teaching and professors themselves, the quality of accommodation units, public transport, nightlife, sports and recreational facilities nearby the faculty, employment opportunities during the studies, the quality of food in canteens, and the quality of work of other faculty bodies (library, registry, and others). These results can be of great importance for the faculties observed since they will point out to the advantages that should be preserved, but also to the disadvantages that should be eliminated in order to maintain a good image compared to other faculties and hence directly influence the attraction of new students.

The main goal of this study is determination the extent to which certain factors of life, both general and student life, affect the overall satisfaction with the studying experience and how this is connected with students performances. Thus, it will be explored relationship between: students' satisfaction with their faculty and students' satisfaction with student life; students' satisfaction with the teaching methods and academic reputation and students' satisfaction with student life; students' satisfaction with the faculty facilities, faculty bodies, and faculty services and the overall satisfaction with student life; students' satisfaction with their housing and the overall satisfaction with student life; students' satisfaction with student life and student performance.

2. MARKETING ASPECTS OF CONSUMER SATISFACTION

2.1. Consumer satisfaction in the profit sector

Satisfaction can be defined as a judgment on the performances of a product or service on the basis of the cognitive (functional) and psychological (emotional) values of the product (Kesić, 2006). Customer satisfaction can serve as an indicator of the success of a business in the past and present, as well as an indicator of its success in the future. Consumer satisfaction is a predictor of repeated purchase and is expressed by consumer loyalty (Vranešević, 2000). Consumer satisfaction lies at the core of the marketing concept and has the leading position in the marketing theories (Dubrovski, 2001). It is based on the postulation that profit will be realized by meeting consumer demands. On the other side, one should also take into account the permanent presence of the danger of spreading unfavourable information on a product, existing among the dissatisfied consumers. Numerous individuals have examined this danger (Collier, 1994, Desatnick, 1989, Hopson & Scally, 1989, Vavra, 1992, retrieved from: Dubrovski, 2001). Young and Ennew (2001) believe the link between

consumer satisfaction and business performance is quite simple. Satisfied consumers buy more often (loyalty), so the authors argue that it is cheaper to serve loyal consumers and that they are less price-sensitive, due to which business costs are lower, and profits higher. Researching the correlation between employee and consumer satisfaction, Heskett et al. (1997) concluded that an employee's positive experiences, attitudes, satisfaction, commitment, and positive assessment of the organizational climate are related to increased levels of consumer satisfaction. Many theoreticians have persistently been discussing the impact of business performance on consumer satisfaction (Harter et al., 2002). In the banking sector, it was determined that higher consumer satisfaction leads to increased "cross-selling", and that, based on an insight into the user database of certain banks, consumer satisfaction was the leading indicator of revenue and growth (Anderson, Sullivan, 1993). Some authors have been observing the relationship between consumers and businesses throughout the life cycle, and believe that the relationship between a consumer and a business goes through different phases of that life cycle. The business has to be prepared to identify the ongoing phase of that life cycle in order to be able to react to consumer expectations (Dwyer, Schurr & Oh, 1987; Bruhn, 2003, retrieved from: Gelade, Young, 2005). Various researches show that consumers have had enough of poor services and that increased satisfaction has a positive impact on personal spending, cash flow and business performance (Rogers, Saenz, 2007).

2.2. Students' satisfaction in the higher education sector

The non-profit sector represents the individuals and organizations who help their society become a community of responsible individuals oriented towards personal / family progress, but also the progress of the community they belong to (Pavičić, 2003). Many non-profit organizations are becoming aware of the fact that recognizing the needs of their customers is the key factor in the success of their business. As non-profit managers become increasingly sophisticated, and non-profit organizations struggle to survive in the ever-changing environment, the fact that organizations need to act in a way that satisfies their customers becomes extremely important (Siri, 1987). Increased social sensitivity of the community poses a number of challenges before different businesses and organizations, according to which the businesses have to operate successfully and, in doing so, pay attention to the welfare of the community and reduce all the harmful and negative activities to a minimum (Glavočević, Radman Peša, 2013).

General welfare marketing is one of the forms of the socially responsible business through which organizations attempt to meet the challenges posed before them by different interest and influential groups (Glavočević, Radman Peša, 2013). Businesses and non-profit organizations achieve the greatest rewards by applying the concept of the general welfare marketing, however, consumers also get awarded with

the sense of a perceived additional value that results from their purchase. In addition, consumers gain the ability to distinguish between competing manufacturers, and can meet their altruistic needs by helping the social community (Baron et al., 2000, retrieved from Gupta, Pirsch, 2006). Polonsky and Speed (2001) have found that the general welfare marketing and its impact on consumers may cause certain risks and concern for them. Consumers can be misguided by the excessive generosity provided by businesses through applying the concept of the general welfare marketing. This can lead to the realization that charitable organizations actually no longer need help, which is why they stop making contributions and the amount of raised funds gets reduced. Sribljinić (2012) believes that there is a positive relationship between customer loyalty and corporate social responsibility. Modern business practices make customer satisfaction their top priority and increasingly invest in socially responsible businesses.

A high quality service is a prerequisite for surviving and maintaining market competitiveness in higher education. The relationship between students' expectations and their satisfaction with the quality of the services provided by an educational institution plays an important role in shaping the reputation of academic institutions. Understanding and knowing the expectations of students may constitute a source of information for higher education institutions, and these could be involved in the creation of their strategy of developing their service quality and gaining an advantage on the market of higher education (Sander et al., 2000). Each interest group in higher education (students, teaching staff, government, etc.) has a special outlook on the quality depending on the specific needs of each individual group. The economic literature on service quality is usually based on the comparison of consumer expectations and their satisfaction with the services actually provided (Zeithmal et al., 1990). O'Neill and Palmer (2004) define service quality in higher education as the difference between students' expectations on what they will get from a higher education institution and their satisfaction with the realized expectations.

Douglas et al. (2006) list four main reason why it is necessary to look into the opinions, expectations and satisfaction of students: (1) to get evidence that students have an opportunity to comment on the situation, and to use these information in improving the services of a higher education institution; (2) to encourage students to reflect on the process of their acquisition of knowledge; (3) to allow the institutions to set the quality criteria and to create the indicators that might contribute to the reputation of their institution on the market; (4) to give students an opportunity to express their satisfaction with their academic experience. Academic institutions are becoming increasingly aware of the importance of students' satisfaction given that it positively influences their students' decision to continue their education at the institution in question, and on the positive word of mouth that will attract prospective students (Harrison Walker, 2014). Students' satisfaction also affects students' motivation, their attendance, and the increase in the income of educational institu-

tions (Navarro Marzo et al., 2005, Schertzer, 2004). Many agree that quality leads to satisfaction, but some make distinction between the two terms, considering quality a general perception, and satisfaction a series of specific aspects (Bitner, 1990). Athiyaman (1997) believes that students' perception of quality has a strong impact on their post-role as a communication "means". From the students' perspective, high quality education creates better opportunities in terms of learning and knowledge, and they believe that the satisfaction or dissatisfaction strongly influences students' success or failure in learning (Aldridge, Rowley, 1998, retrieved from Li Wei, 2005). Educational aspects and class delivery aspects become one of the most important determinants of the perception of teaching quality and students' satisfaction (Elliot, Shin, 2002, Brown, 1998, Fraser, 1994, retrieved from Li Wei, 2005). While until recently management used to be an important factor in the teaching sector, management today assumes a different role, which is the intention and the will to satisfy students, and thus affects their perception of the service quality. All the attention is focused on the negative aspects of the model which emphasizes that dealing with dissatisfaction, and the aspects that lead to the said, can increase satisfaction. Therefore, the importance of administrative staff gets an increasingly important role in the process of meeting students' demands (Nyer, 2000). Badri et al. (2010) research is specific because of the measurement of parents' satisfaction at measuring satisfaction in schools/faculties, because they enable schooling to their children. In fact, parents' satisfaction is considered similar to users' satisfaction and their satisfaction influences the parents' loyalty to the school their child is attending (Bhote, 1996; Salisbury et al, 1997; Scheuing, 1995, cited from: Badri et al. 2010).

The complexity of meeting the criteria of the above mentioned factors has led many authors to closely examine students' satisfaction with the quality of student life. In their study, Sevda and Ozlem (2014) tried to determine the satisfaction with student life by including the variables of student life quality (social, scientific and service factors), life satisfaction, and identification. The study also attempted to evaluate the impact of the academic program of the chosen study, social life, and facilities and services provided at the faculty on the quality of student life as compared to other similar faculties in Turkey and other countries. Life satisfaction is the top priority of man in relation to the satisfaction with his society, family, friends, school, faculty, and health. According to the "bottom-up spillover" theory (Sirgy, 2010), all the mentioned variables affect life satisfaction. Satisfaction with student life affects life satisfaction. Based on this information, a study was conducted on how student life satisfaction affects the satisfaction with life in general (Sevda, Ozlem, 2014). A similar research was carried out in Croatia by Brkljačić and Kaliterna Lipovčan (2010), examining life satisfaction among students. Life satisfaction is a report on how one assesses and evaluates one's entire life.

Clewes (2003) suggests three different approaches to measuring the quality of education from students' perspective. Model on which the research was conducted

is based on the modification of the SERVQUAL (*Service Quality*) model developed in 1988 by Parasuraman, A., Berry, L.L., Zeithaml, V.A. (1988, 1990, 1991). The first approach is based on the SERVQUAL method. However, in the studies based on the SERVQUAL instrument there was no consensus on which of the dimensions of quality had the key importance in higher education (*tangibility, reliability, identification, trust and empathy*), so the HEdPERF instrument was created precisely for researching the quality of higher education. The second approach in assessing the quality of higher education institutions is analysing students' satisfaction with only the quality of teaching and learning at a particular higher education institution. There is also the third approach, which uses the methods for assessing students' satisfaction with the overall student experience as an indicator of quality. Such researches cover various elements that contribute to students' satisfaction with the overall service of a higher education institution: *the quality of teaching, course program and class organization, library services, registry services, IT support, work of the student union, accompanying services such as canteen services, accommodation, sports facilities, social life, entertainment and the like.*

Some authors claim that students are customers and need to be treated as the customers of manufacturing companies. They are considered customers since they buy knowledge in order to satisfy their own needs for knowledge. Students' satisfaction with the overall faculty environment is essential for keeping them at the relevant faculty, as well as for their recommendations of the faculty to prospective students (Danjuma, Rasli, 2012). Many teachers are reluctant to accept the student-customer model, and are suspicious of every attempt at adapting student environment to the business concept (Mark, 2013). Machado, Brites, Magalhaes and Sa (2011) investigated the satisfaction with higher education as the key point in students' development. Numerous institutions recognize higher education as a "service sector", which is why they should put emphasis on meeting the expectations and needs of their customers, in the this case, their students. In order to better compete with other educational institutions, many faculties adopt a marketing oriented strategy to differentiate themselves from their competitors (Kotler and Fox 1995; Mihanović 2007, 2009; Pavičić, J.; Alfirević, N.; Mihanović, Z. 2007). It is important to have a good understanding of the target market (students), evaluate their needs, adapt the offer to meet the demand, and thus increase the satisfaction of the "customers" - students (Keegan, Davidson, 2004).

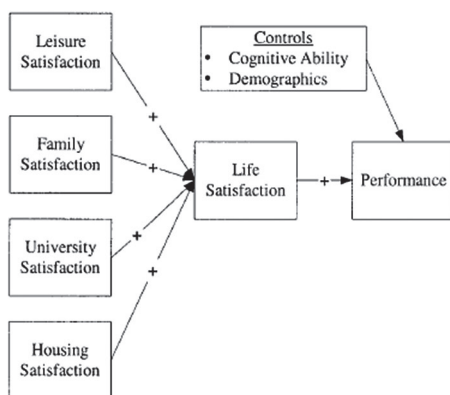
Researches have also been carried out with respect to the attitude of students towards their educational institution. This relationship is defined by two factors. One is persistence, with the aim of graduating from college and earning a diploma, and the other is the possibility of using the diploma in other institutions (Tinto, 1982, retrieved from Machado, Brites, Magalhaes, Sa, 2011). A faculty institution must constantly work on improving the services provided to their students. That way, the students will be satisfied with the service and therefore with the faculty (Elliot, Healy,

2001). Certain authors have presented the dimensions of students' satisfaction with their faculty services, based on numerous researches. They proposed grouping these services into the following categories: facilities near the faculty, teaching staff, teaching methods, environment, enrolment, and services by other faculty bodies. All these services, which are under the direct control of the faculty, can be considered the determinants of students' satisfaction (Navarro Marzo et al., 2005). There are four groups of factors that influence students' satisfaction: institutional factors, extra-curricular factors, students' expectations, and student demographics. Institutional factors therefore consist of academic (the quality of education, communication with the teachers in and outside the classes, textbooks and other teaching materials) and administrative (faculty practice and philosophy in administration) factors. Extra-curricular factors include social, health, cultural and sport activities, as well as transportation. Students' expectations represent the choice of faculty and employment opportunities after graduation. Demographic factors include age, gender, attendance, etc. (Aldemir, Gulcan, 2004). Rode et al. (2005) base their model (Figure 2.) on the perspective that they call "integrated life". This perspective illustrates how individual performances of a man influence his satisfaction in all life domains. They agree that the overall life satisfaction of students, and not just their satisfaction with their faculty as an institution, affects the performance of students, the ease of mastering the assigned tasks, and their involvement in the teaching process. The "Bottom-up" theory of life satisfaction suggests that life satisfaction represents the overall attitude which consists of the components of satisfaction with various life areas, but the impact of any specific variable of life on overall happiness varies depending on the population.

On the other hand, Gibson (2010) examined students' satisfaction and included some non-academic aspects therein, e.g. university reputation, contact personnel quality in administrative departments, acknowledgements and services, quality of teaching and IT facilities and student body diversity. Simomu and Dahl (2012) are based more on teaching quality analysis and the effect of that variable on students' satisfaction. They have examined the quality of teachers' performance, workload, social life, religious life, sports activities, family influence, employment opportunities, future expectations, difference between part-time and full-time students. Sergy et al. (2010) also examined the issue of students' satisfaction and its influences (Figure 3.). In their paper, these authors have based their research on the examination of satisfaction with the academic aspects of student life, e.g.: satisfaction with the faculty, satisfaction with the teaching methods, satisfaction with the class environment, satisfaction with the workload, satisfaction with the academic reputation and academic differences. Furthermore, the research included the social aspects of student life, such as: satisfaction with campus accommodation, satisfaction with international programmes and services, satisfaction with spiritual programmes and services, satisfaction with clubs and student social organisations and satisfaction

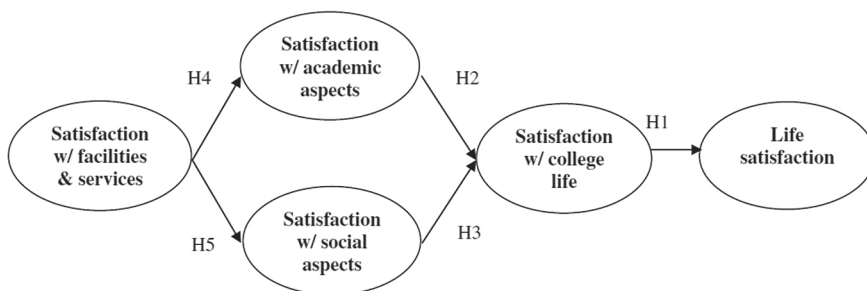
with recreational activities. The authors have conducted this research by using two models. The first model included investigating how leisure, services, and academic and social aspects of life affect students' satisfaction with student life. The second, "extended" model included investigating how the satisfaction with student life affects the overall life satisfaction.

Figure 2.: Predicted Path Analytic Mode



Source: Rode, C., J., et al., Life satisfaction and student performance, *Academy of Management Learning & Education*, Vol. 4, No. 4, 421-433, 2005

Figure 3.: The extended model



Source: Sirgy, M., J., et al., Quality of College Life (QCL) of Students: Further Validation of a Measure of Well-Being, *Social Indicators Research*, 12; 99(3). 2010. pp.384

3. MEASURING PERFORMANCE IN EDUCATIONAL SECTOR

Measuring performance is still a major issue for businesses and other organizations (Meyer, 2002). In theory, but also in practice, measuring student performance is quite complex. There is no generally accepted procedure of measuring student performance, and individual researchers tend to conduct and explain it in their own way. Educational sector is a part of the public sector whose basic purpose is to satisfy the public needs. With the aim of monitoring the extent to which those needs have been met, many countries use different success indicators. Rowe (2004) describes them as indices by which data on functionality and quality of service providers and public sector are measured and assessed. In their paper Schochet and Chiang (2010) schematically divided performance measurement into two parts. In the first part the authors deal with the internal school issue: "Which teacher performs their job in a certain educational institution exceptionally well or exceptionally poorly with respect to all other teachers in that institution?", while in the second part they examine the inter-school issue: "Which teachers perform their job exceptionally well or exceptionally poorly with respect to all other teachers in the entire school district?". Furthermore, Rittschof and Chambers (2011), with the help of modern information graphs, tend to better understand the differences in the students' performances. Also, E. Umble and M. Umble (2012) conducted the performance measurements in a very interesting way. In fact, they illustrated the effect of the performance measurement system on the organisational performances among the students through the game "The Blue-Green Game". This game illustrated the significance of performance measurement, student encouragement system and their strength to reconsider their decisions on such an important subject. Hanushek (1996) studied in his paper the difference between performances of seventeen-year old students based on race and ethnical affiliation.

Rode et al. (2005) researched not only the effect of satisfaction with the faculty on students' performances, but the influence of the overall life satisfaction on them. Research has shown that the students who are more satisfied with their overall life have better results and cope more easily with studying challenges and vice versa. In both cases, the research has demonstrated that life satisfaction is important, not only from the aspect of influencing the social environment or keeping students, but academic performance as well. Numerous studies have shown that the satisfaction with particular life areas is in strong correlation with the overall life satisfaction (e.g., Andrews & Withey, 1976; Campbell, Converse, & Rodgers, 1976; Near, Smith, Rice, & Hunt, 1983; Near, Smith, Rice, & Hunt, 1984; Rice, Near, & Hunt, 1979, cited from Rode et al., 2005). From all of the aforementioned, we can deduce that there are numerous possibilities for conducting performance measurements. Measuring student success is important for every higher education institution. Reliable measures of student success are necessary in order to assess the quality and effectiveness of the

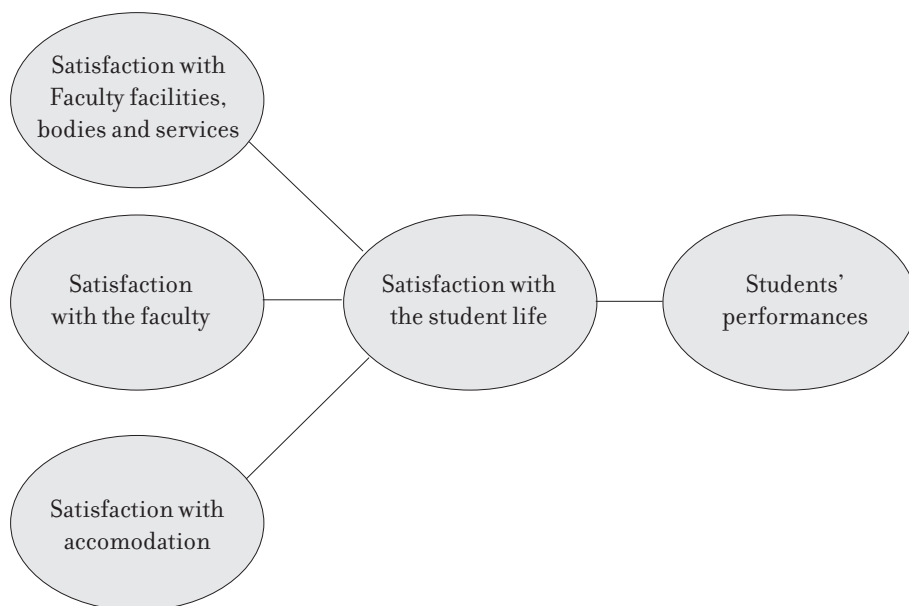
programs carried out at faculties, and to identify risk factors and factors of success. The researchers mainly focus their studies on students' "career", that is, on their success at the relevant faculty as measured by the grades which they earn in different courses at the faculty (Mossi, Venuleo, Tondo, Salvatore, 2012). The education sector is a part of the public sector which, as opposed to the profit sector, has the mission to meet public needs. In most countries, the public sector evaluation is done by using certain performance indicators. Rowe (2004) describes them as the indexes that measure and evaluate information on the functionality and quality of service providers and the public sector itself.

4. EMPIRICAL RESEARCH

4.1. Research Model

For the purposes of this study, a model was created that actually represents a combination of the models used by Rode et al. (2005) and Sirgy et al. (2010) in their research of students' satisfaction and performance. Performance was measured through students' grade point average, modelled after Rode's model. By combining these two models, the model shown in Figure 4. was created.

Figure 4.: Research mode



Source: authors' systematization

Satisfaction with the student life encompasses the following aspects: (1) satisfaction with the faculty (teachers, teaching methods, academic reputation) - cited from Rode et al. (2005), in the original model, the influence of this item on the overall life satisfaction and performances was analysed; (2) faculty facilities, bodies and services (student registration office, library, infolab, parking) - cited from Sergy et al. (2010), in the original model, the influence of this variable on the satisfaction with academic and social aspects was analysed; (3) accommodation (whether the students live in dorms, private accommodation or with parents) - cited from Rode et al. (2005), the influence of this factor on the overall life satisfaction and students' performances was analysed.

By setting goals, modelled after the established model, we will attempt to determine the extent to which certain factors of life, both general and student life, affect the overall satisfaction with the studying experience, namely: what is the relationship between: (1) students' satisfaction with their faculty and students' satisfaction with student life; (2) students' satisfaction with the teaching methods and academic reputation and students' satisfaction with student life; (3) students' satisfaction with the faculty facilities, faculty bodies, and faculty services and the overall satisfaction with student life; (4) students' satisfaction with their housing and the overall satisfaction with student life; (5) students' satisfaction with student life and student performance.

The research was carried out by means of a questionnaire that contained 28 questions. The survey was conducted among the students of the University of Split, a total of 191. The survey was conducted at ten faculties in Split, namely: Faculty of Economics, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, Faculty of Civil Engineering, Faculty of Philosophy, Faculty of Maritime Studies, Faculty of Chemical Engineering and Technology, Faculty of Law, Faculty of Kinesiology, Faculty of Medicine, and Faculty of Natural Sciences.

4.2. Research Results

The study included 77% of women and 23% of men respondent. The largest number of respondents, 45% has between 21 and 23 years. From 24 to 26 years has 27.2% of respondents, from 18 to 20 years of age have 24.6% of respondents, while the smallest number of respondents, 3.2%, is 27 years old and more. The largest number of respondents, 34% of them is on second year of graduate studies, 22.5% of them is on third year of undergraduate study, and 21% of them is on second year of undergraduate study. On the first year of graduate studies is 13.6% of respondents, while the smallest number of respondents are on the first year of undergraduate study, 8.9% of them. Most respondents have full-time status, 94.8% of them, while only 5.2% are part-time students. The largest number of participants is attending the Faculty of Humanities and Social Sciences, 24.6% of them. This is followed by 16.2% of respondents who attend the School of Medi-

cine, 13.6% of respondents who attend the Faculty of Economics. Faculty of Kine-
siology attended 10.5% of respondents; Faculty of Law attended 8.4% of respond-
ents, and the Faculty of Science attended 7.3% of respondents. Faculty of Civil
engineering, Architecture and Geodesy attended 5.3% of the respondents, 5.2%
of respondents attended Faculty of Chemistry and Technology and the Faculty of
Faculty of Electrical Engineering, Mechanical engineering and Naval Architecture.
The minimum number of participants in this study attending the Faculty of Mari-
time Studies, 3.7% of them.

*The first objective to examine is the impact of teaching methods and academic reputa-
tion on the total students' satisfaction with student life.* The impact of teaching meth-
ods was observed through two variables: (1) adequate equipment of the faculty with
technology for teaching and (2) interaction between teachers and students in class.
The impact of the academic reputation was also observed by two variables: (1) reputa-
tion of the Faculty and (2) reputation of teachers. For the purpose of determining the
connectedness of the observed variables, we will use the Pearson's linear correlation
coefficient, which is also the most well-known measure of linear correlation and it
will be conducted four tests to determine the impact of four claims to the total satis-
faction of students with quality of student life.

Table 1. illustrates that Pearson's correlation coefficient amounts to $r = 0.385$,
which means that there is a weak positive correlation between the satisfaction with
well-equipped faculty with adequate technology and overall student satisfaction with
the quality of student life.

Table 1.: The impact of Faculty equipment with adequate technology on Satisfaction with the
quality of student life

		Faculty equipment with adequate technology	Satisfaction with the quality of student life
Faculty equipment with adequate technology	Pearson Correlation	1	0.385
	Sig. (2-tailed)		0.000
	N	191	191
Satisfaction with the quality of student life	Pearson Correlation	0.385	1
	Sig. (2-tailed)	0.000	
	N	191	191

Source: Author's.

Table 2. shows that methods of teaching and academic reputation in all cases
have a positive impact on students' satisfaction with student life, and the growth
of one variable will follow the growth of other variables. In three cases, it is a weak
positive correlation (0.385; 0.395; 0.399), and in one case it is a medium-high
positive correlation (0.505). Based on the performed analysis it can be *concluded that*

the grater the student's satisfaction with the methods of teaching and academic reputation the greater the satisfaction with the overall student life.

Table 2.: Value, the direction and intensity of Pearson linear correlation coefficient

VARIABLES	VAULE OF THE COEFFICIENT	DIRECTION AND THE INTENSITY
adequate equipment of the faculty with technology for teaching	0,385	weak positive correlation
interaction between teachers and students in class	0,395	weak positive correlation
reputation of the Faculty	0,399	weak positive correlation
reputation of teachers	0,505	medium strong positive correlation

Source: Author's.

The second objective to examine is the impact of the university facilities, university authorities and services to the total satisfaction of students with student life. The impact is seen through the 12 claims. For the purpose of determining the connectedness of the observed variables, we will use the Pearson's linear correlation coefficient.

Table 3. shows that the content of university, university authorities and services has in all cases a positive impact on students' satisfaction with student life, and the growth of one variable will follow the growth of other variables. In eleven cases except speed of internet conection, it is a weak positive correlation. Based on the analysis it can be concluded that the grater the students satisfaction with the content of university, university authorities and services the greater the satisfaction with the overall student life.

Table 3.: Value, the direction and intensity of Pearson linear correlation coefficient

VARIABLES	VAULE OF THE COEFFICIENT	DIRECTION AND THE INTENSITY
Library staff	0,264	weak positive correlation
Reservations of place for learning	0,262	weak positive correlation
Organization of library materials	0,287	weak positive correlation
Availability of materials for teaching	0,269	weak positive correlation
Availability of computers	0,334	weak positive correlation
Info lab staff	0,305	weak positive correlation
Speed of Internet connection	0,192	no correlation
Equipment quality	0,265	weak positive correlation
Age of computers	0,206	weak positive correlation

VARIABLES	VAULE OF THE COEFFICIENT	DIRECTION AND THE INTENSITY
Availability of parking	0.259	weak positive correlation
Sports and recreational facilities	0.349	weak positive correlation
Kupovina knjiga i ostalog materijala	0.427	weak positive correlation

Source: Author’s.

The third objective to examine is the impact of satisfaction with accommodation on the overall satisfaction with the student life. Table 4 illustrates the structure of the respondents according to different forms of accommodation: dormitory accommodation, private renting accommodation, living with parents and their satisfaction with accommodation. For the purpose of establishing the connectedness of other observed variables, Pearson’s linear correlation coefficient will be applied. Table 4. illustrates that the largest number of respondents live with their parents, and the smallest number of respondents is located in the dorms. We can also see that the majority of respondents, regardless of the type of housing, fully satisfied with accommodation.

Table 4.: Different forms of accommodation and students satisfaction with them

Satisfaction with accommodation							
		completely dissatisfied	somewhat satisfied	nor dissatisfied neither satisfied	somewhat satisfied	fully satisfied	Total
accom- modation	no answer	0	1	0	0	0	1
	dormitory	0	1	2	2	8	13
	private	2	8	13	13	9	45
	With family	1	1	20	29	81	132
Total		3	11	35	44	98	191

Table 5. shows that Pearson’s correlation coefficient amounts to $r = 0.092$, which means that there is no correlation between the satisfaction with accommodation and the overall satisfaction with the student life and students’ satisfaction with accommodation does not impact overall satisfaction with the student life.

Source: Author’s.

Table 5.: The impact of satisfaction with accommodation on the overall satisfaction with the student life

		Satisfaction with accommodation	Satisfaction with the student life
Satisfaction with accommodation	Pearson Correlation	1	-0,092
	Sig. (2-tailed)		0,207
	N	191	191
Satisfaction with the student life	Pearson Correlation	-0,092	1
	Sig. (2-tailed)	0,207	
	N	191	191

Source: Author's.

The final goal of this paper is to examine the impact of student satisfaction with student life on student performance on University of Split. The performances of students are observed through three variables: regularity of completing the years of study, mastering the knowledge, acquiring the faculty curriculum, and the general success at the faculty. At the beginning it will be examine the relationship between student satisfactions with student life due to the regularity of completing the years of study, Table 6. For the purpose of establishing the connectedness of other observed variables, Pearson's linear correlation coefficient will be applied in two tests.

In Table 6., it can be seen that the greatest number of respondents regularly completed the years of study, and the smallest number of respondents is repeated more than one year. We can also see that the majority of respondents, regardless of the regularity of completing the study, satisfaction with the quality of student life rated as very good, while the smallest number of respondent's satisfaction with the quality of student life rated as insufficient.

Table 6.: The respondents' satisfaction and regularity of completing the years of study

Regularity of completing the years of study					
	I repeated more years	I repeat only one year	I regularly passed all	Total	
student satisfactions with student life	insufficient	1	4	5	10
	sufficient	1	9	10	20
	good	4	14	43	61
	very good	5	12	63	80
	excellent	0	6	14	20
Total		11	45	135	191

Source: Author's.

From Table 7. it can be concluded that student satisfaction with student life has weak positive impact on mastering the knowledge, acquiring the faculty curriculum

and general success at the faculty. In both cases it is a weak positive correlation (0.261; 0.258). Based on the analysis it can be concluded that students who are more satisfied with the overall student life have better student performance.

Table 7.: Value, the direction and intensity of Pearson linear correlation coefficient

VARIABLES	VAULE OF THE COEFFICIENT	DIRECTION AND THE INTENSITY
mastering the knowledge, acquiring the faculty curriculum	0,261	weak positive correlation
general success at the faculty	0,258	weak positive correlation

Source: Author's.

In addition, it was also tested satisfaction with the quality of student life in relation to the faculty that respondents attending, Table 8.

Table 8.: Satisfaction with the quality of student life in relation to the faculty that respondents attending

		Satisfaction with the quality of student life					
		insuf- ficient	suffi- cient	good	very good	excel- lent	Total
Faculty	Faculty of Economics	0	0	8	14	4	26
	Faculty of Electrical Engineering, Mechanical engineering and Naval Architecture	0	0	2	5	3	10
	Faculty of Humanities and Social Sciences	5	3	17	19	3	47
	Faculty of Civil engineering, architecture and Geodesy	0	1	1	5	3	10
	School of Medicine	0	3	11	13	4	31
	Faculty of Kinesiology	0	1	6	11	2	20
	Faculty of Chemistry and Technology	2	3	3	2	0	10
	Faculty of Maritime studies	0	2	3	1	1	7

	Satisfaction with the quality of student life				
Faculty of Law	3	3	4	6	0
Faculty of Science	0	4	6	4	0
Total	10	20	61	80	20

Source: Author's.

5. CONCLUSION

The main goal of this study was to determination the extent to which certain factors of life, both general and student life, affect the overall satisfaction with the studying experience and how this is connected with students performances. The survey was conducted among the students of the University of Split, a total of 191. Students' satisfaction is becoming an increasingly important variable in the success of an educational institution because the reputation of the institution and the number of prospective students enrolled depends on it. Faculties must be willing to introduce changes in order to become more competitive. It is crucial that faculties invest in knowledge, i.e. in teacher training, teaching methods, faculty facilities, and so on. In this research it has been found that the greater the students' satisfaction with their faculty facilities, faculty bodies, and faculty services, the greater the overall satisfaction with student life is. We observed the effects of the following factors on the satisfaction with student life: library staff, reserving a place for studying, organization of library materials on the shelves, availability of learning materials, availability of computers, infolab staff, the Internet speed, equipment quality, age of computers, availability of parking, sports and recreational facilities, and purchase of books and other materials. The variable that influences the satisfaction with student life most is the purchase of books and other materials. The variable that has no influences on satisfaction with student life is the Internet speed. The said points to the fact that additional facilities at the faculties represent an important item of impact on students' satisfaction. Students spend more time in libraries and infolabs and widely use the stores where they can get the necessary books and teaching materials. Timely investment in these segments will ensure a positive image of the faculty, and the students will be more willing to replace their homes with the very faculty as a place for learning, and preparing seminar and other papers. Likewise, we have rejected the claim that the greater students' satisfaction with housing, the greater their overall satisfaction with student life is. Although it was expected that the satisfaction with accommodation affects the satisfaction with the quality of student life, the analysis did not show this, perhaps mostly because the majority of the respondents lived with their parents. Students are satisfied with student life when their faculty is adequately equipped with the technology necessary for teaching, and when there is a good interaction between the teachers and students in class. Students are also satisfied

with the quality of student life when they trust that the reputation of their faculty is positive and that the reputation of their teachers is also positive. The said points to the fact that faculties must systematically invest in the technology needed to carry out high quality teaching, as well as in their own staff through the opportunities of teacher training and familiarizing the teachers with the new opportunities of working and communicating with students. It is certain that more changes will be introduced in the forthcoming years, and that teachers and faculties will have to be ready to adapt to the changes in the education system in order to make their students more satisfied.

Ultimately, it has been found that higher students' satisfaction with student life has an impact on students' better performance. When analysing the impact of students' satisfaction with the quality of student life on their performance, we observed the variables of the regularity of completing the years of study, mastering the knowledge, acquiring the faculty curriculum, and the general success at the faculty. The acquisition of the faculty curriculum had a slightly greater impact than the general success at the faculty. Looking at the analysis of the satisfaction with the quality of student life in relation to the faculties, there were several conclusions. Certain students from the Faculty of Humanities and Social Sciences, Faculty of Law, and Faculty of Chemistry and Technology were the only ones who assessed their satisfaction with the quality of student life with the grade insufficient, so it can be said that these faculties have to work mostly on their reputation and quality in order to achieve a greater satisfaction of their students. The faculties that demonstrated a kind of "golden mean", the majority of whose students assessed their satisfaction with the quality of student life with the grade good, are the Faculty of Maritime Studies, School of Medicine, and Faculty of Science. These faculties must surely also work on improving their quality and reputation in order to ensure a greater satisfaction of their students. The faculties awarded the highest grades (very good and excellent) by the students were the Faculty of Kinesiology, Faculty of Economics, Faculty of Civil engineering, Architecture and Geodesy, and Faculty of Electrical Engineering, Mechanical engineering and Naval Architecture as 50% or more of their students assessed their faculties with the grade very good and excellent. These results confirm the assumption that all faculties must work to keep pace with new technologies, and invest in their teachers and other staff, and then in the faculty facilities that include libraries, IT labs, and sports and recreational facilities. Regardless of the fact that the hypothesis on the satisfaction with housing was rejected, it is still necessary to invest in the quality of student dormitories. All the mentioned variables will have an impact on the further student performance at the faculties. The future also provides an opportunity to conduct a similar research at all the universities in Croatia, as well as to observe other relevant factors of satisfaction, particularly those of more personal nature (religion, extra-curricular activities, relationship with other students, health, etc.).

REFERENCES:

- Aldemir, C., Gülcan, Y., "Student Satisfaction in Higher Education", Higher Education Management and Policy, No.: 19, Volume: 16, Issue: 2, (2004): 109-122
- Anderson, E. W., & Sullivan, M. W., "The antecedents and consequences of customer satisfaction for firms", Marketing Science, 12, (1993): 125-143
- Athiyaman, A., "Linking Student Satisfaction and Service Quality Perception: The case of university education", European Journal of Marketing, Vol. 31, (7), (1997): 528-540
- Badri, M., et al., "A modified customer-satisfaction index model for the education sector in Abu Dhabi", International Journal of Business and Public Administration, Volume 7, Number1, (2010): 148-159
- Batinić, A. B. "Utjecaj zadovoljstva studenata fakultetom i studentskim životom na studentske performance - primjer Sveučilišta u Splitu", Diplomski rad, Ekonomski fakultet Split, (2015)
- Bitner, M.J., "Evaluating Service Encounters: The effect of physical surrounding and employee responses", Journal of Marketing, Vol. 54, (1), (1990): 69-82
- Budak, J., Slijepčević, S., Švaljek, S. "Financijske potpore studentima u sustavu visokog obrazovanja u Republici Hrvatskoj", Ekonomski institut, Zagreb, (2009)
- Brkljačić, T., Kaliterna, L., Lipovčan, Lj., "Zadovoljstvo životom i osjećaj sreće kod studenata", Suvremena psihologija 13, (2010)
- Clewes, D., "A student-centred conceptual model of service quality in higher education", Quality in higher education, Vol.9, NO. 1, (2003)
- Danjuma, I., Rasli, A., "Service quality, satisfaction and attachment in higher education institutions: A theory of planned behaviour perspective", International journal of academic research, Vol.4. No. 2., (2012): 96
- Douglas, J., Douglas, A., Barnes, B., "Measuring student satisfaction at a UK university", Quality Assurance in Education, Vol. 14 Iss: 3, (2006): 251-267
- Dubrovski, D., "The role of customer satisfaction in achieving business excellence", TQM, Vol. 12, NO. 7&8, (2001): 920-925
- Elliot, K. M., & Healy M. A., "Key factors influencing student satisfaction related to recruitment and retention", Journal of Marketing for Higher Education, 10, (2001): 1-11
- Eurostat, (2012) <http://ec.europa.eu/eurostat/documents/3217494/5735241/EC-30-12-534-EN.PDF/ffb0b7c9-bf5e-4696-984f-a05b135fe5a3>
- Gelade, G.A., Young, S., "Test of a service profit chain model in the retail banking sector", Journal of occupational and organizational psychology, 78, (2005): 1-22
- Gibson, A., "Measuring business student satisfaction: a review and summary of the major predictors", Journal of Higher Education Policy and Management Vol. 32, No. 3, (2010): 252-257
- Glavočević, A., Radman-Peša, A., "Društveno odgovorno poslovanje i CRM kao način integriranja društvene odgovornosti u marketinške aktivnosti", Oeconomica Jadertina (2013)
- Gupta S. i Pirsch J., "A Taxonomy of Cause-Related Marketing Research: Current Findings and Future Research Directions", Journal of Nonprofit & Public Sector Marketing, Vol. 15 Issue 1/2, (2006) 25-43, 19p

- Gupta S. i Pirsch J., "The company-cause-customer fit decision in cause-related marketing", Journal of Consumer Marketing, Vol. 23 Iss: 6, (2006): 314 - 326
- Haralambos, M. i Holborn, M., Sociologija: Temе i perspektive. Zagreb, Golden Marketing, (2002)
- Harrison Walker, L.J., "When opposites detract: Student (dis)satisfaction in higher education and the importance of compatibility management", Academy of Educational Leadership Journal, Volume 18, Number1, (2014)
- Harter, J. K., Schmidt, F. L., & Hayes, T. L., "Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis", Journal of Applied Psychology, 87, (2002): 268-279
- Heskett, J. L., Sasser, W. E., Jr, & Schlesinger, L. A., The service profit chain. New York: Free Press., (1997)
- Izmjene i dopune Zakona o visokim učilištima, Narodne novine 48/95, 14. srpnja 1995.
- Izmjene i dopune Zakona o visokim učilištima, Narodne novine 29/96, 17. travnja 1996.
- Keegan, W. & Davidson, H., Offensive marketing: gaining competitive advantage, Elsevier Inc., Amsterdam, (2004)
- Kesić, T.: Ponašanje potrošača, Opnio, Zagreb, (2006)
- Kotler, P., Fox, K.F.A.: Strategic marketing for educational institutions. Prentice Hall, New Jersey, (1995)
- Li-Wei, Mai., "A comparative study between UK and US: The student satisfaction in higher education and its influential factors", Journal of marketing management, 21, (2005): 859-878
- Lućin, P., "Osiguranje kvalitete u Europskom visokoobrazovnom prostoru", Nakladna zaklada za znanost, visoko školstvo i tehnologijski razvoj Republike Hrvatske, Rijeka, (2007): 5, 8, 13, 17
- Machado, M., L., Brites, R., Magalhaes, A., Sa, M., J., "Satisfaction with Higher Education: critical data for student development", European Journal of Education, Vol. 46, No. 3, (2011)
- Mark, E., "Student satisfaction and the customer focus in higher education", Journal of Higher Education Policy and Management, Vol. 35, No. 1 2-10, (2013)
- Meyer, M.: Rethinking performance measurement, Beyond the balanced scorecard, The Wharton School, University of Pennsylvania, (2002)
- Mihanović, Z.: „Uloga korisnika u visokom obrazovanju: jesu li studenti aktivni dionici?“ (The role of customers in higher education: are students active stakeholders?) Tržište, Vol. XIX, br. 1., (2007): 115-132
- Mihanović, Z., Zekić, K., Influence of students' satisfaction with student life quality on their performance: The case of Higher education institutions in Portugal, ICQH, Proceedings Book, Sakarya / Turkey, (2015): 205-217
- Mihanović, Z., Arnerić, J., Pepur, M.: „Differences Testing Between Clusters: Evidence From Market Orientation of Croatian Faculties“, Proceedings of the 10th International Symposium on OPERATIONAL RESEARCH, Nova Gorica, Slovenia, Slovenian Society Informatika (SDI), Section for Operational Research (SOR), (2009): 535-544
- Mossi, P., Venuleo, C., Tondo, P., Salvatore, S., "The measurement of students performance. The use of an extended Rasch model for the analysis of predictors of high educational performance", Electronic Journal of Applied Statistical Analysis, Vol. 5, Issue 3, (2012): 393 - 399
- Navarro Marzo, M., Pedraja Iglesias, M., Rivera Torres, P., "A new management element for universities:

- satisfaction with the offered courses*", International Journal of Educational Management, Vol. 19 Iss: 6, (2005): 505 - 526
- Nyer, P.U., "An Investigation into Whether Complaining Can Cause Increased Consumer Satisfaction", Journal of Consumer Marketing, Vol. 17, (1), (2000): 9-19
- O'Neill, M.A., Palmer, A., "Importance performance analysis: a useful tool for directing continuous quality improvement in higher education", Quality Assurance in Education, Vol. 12 Iss: 1, (2004): 39 - 52
- Parasuraman, A., Berry, L.L., Zeithaml, V.A.: "SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality", Journal of Retailing, Vol. 64, No. 1, (1988): 12-40
- Parasuraman, A., Berry, L.L., Zeithaml, V.A.: "Refinement and Reassessment of the SERVQUAL Scale", Journal of Retailing, Vol. 67, No. 4, (1991): 420-450
- Pavičić, J.: Strategija marketinga neprofitnih organizacija, Masmedia, Zagreb, (2003)
- Pavičić, J.; Alfrević, N.; Mihanović, Z.: "Market orientation in managing relationships with multiple constituencies of Croatian higher education", Higher Education, Vol. 57, No. 2, (2007): 191-207
- Polonsky M. i Speed R., Linking sponsorship and cause related marketing: Complementarities, and conflicts, European Journal of Marketing, Vol. 35 Iss: 11/12, (2001): 1361 - 1389
- Rittschof, K., Chambers, W., "Modern Measurement Information Graphics for Understanding Performance: The Blue-Green Game, Decision Sciences", Journal of Innovative Education, (2011): 462-466
- Rode, C.J., et al., "Life satisfaction and student performance", Academy of Management Learning & Education, (2005): 421-425
- Rogers, P., Saenz, H., "Make your back office an accelerator", Harvard Business Review, Vol. 85, No. 3, Australian Council for Educational Research, (2007)
- Rowe, Ken J., "Analysing and Reporting Performance Indicator Data: „Caress“ the data and user beware!", (2004)
- Sander, P., Stevenson, K., King, M. & Coates, D., "University Students' Expectations of Teaching", Studies in Higher Education, Volume 25, Issue 3, (2000): 309-323
- Sevda, A., Ozlem, A., A., "Quality of College Life (QCL) of Students in Turkey: Students' Life Satisfaction and Identification", Social Indicators Research, Volume 115, Issue 2, (2014): 869-884
- Schertzer Clinton, B. & Schertzer Susan M. B., "Student Satisfaction and Retention: A Conceptual Model", Journal of Marketing for Higher Education, 14:1, (2004): 79-91
- Sirgy, M.J., et al., "Quality of College Life (QCL) of Students: Further Validation of a Measure of Well-Being", Social Indicators Research, 12: 99(3), (2010): 375-390
- Siri, N. Espy, "Keep the customer satisfied", Non-profit world, Vol. 5, No. 4, (1987)
- Schochet, P.Z., Chiang, H., S., "Error Rates in Measuring Teacher and School Performance Based on Student Test Score Gains", Mathematica Policy Research, (2010): 8-10
- Smimou, K., Dalh, W.D., "On the Relationship Between Students' Perceptions of Teaching Quality, Methods of Assessment and Satisfaction", Journal of education for business, (2012)
- Srbiljnović M., "Utjecaj društvene odgovornosti poduzeća na ponašanje potrošača u Hrvatskoj", Zbornik Ekonomskog fakulteta u Zagrebu, Vol. 10 No. 2, (2012): 161 - 180
- Šćukanec, N.: Nastanak zajedničke visokoobrazovne politike na razini Europske unije, Institut za razvoj obrazovanja, Zagreb, (2010)

Vranešević, T.: Upravljanje zadovoljstvom klijenata, Golden marketing, Zagreb, (2000)

Yeung, M.C.H., Ennew, C.T., "Measuring the impact of customer satisfaction on profitability: A sectoral analysis", Journal of targeting, measurement and analysis for marketing, Vol. 10, 2, (2001): 106-116

Zekić, K.: Zadovoljstvo studenata kvalitetom studentskog života na primjeru Ekonomskog fakulteta u Aveiru, Diplomski rad, Ekonomski fakultet Split, (2015)

Zeithaml, V.A., Parasuraman, A. and Berry, L.L., Delivering Service Quality, Free Press, New York, NY. (1990)

THE DRAWBACKS AND REFORM OF CHINA'S CURRENT RURAL LAND SYSTEM: AN ANALYSIS BASED ON CONTRACT, PROPERTY RIGHTS AND RESOURCE ALLOCATION

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ABSTRACT

This article analyzes the drawbacks of China's current rural land system (the Household Contract System based on the collective ownership) mainly from the perspectives of contract, property rights and resource allocation. This article defines the Household Contract System as a lease where the collective (landowner) leases land to its members to farm independently. The drawbacks of China's current rural land system mainly include instability of the peasants' land use right and insecurity of their land income right weakening peasants' enthusiasm for investment in land, and a lot of restrictions on the transfer of peasants' land leases obstructing the flows and optimized allocation of labor, land and capital. According to analysis, the drawbacks of China's current rural land system result mainly from the collective ownership and the government-run nature of the collective. This article then makes and elaborates the proposition of the privatization of rural land to peasants. It also analyzes the government's land rights in private ownership of land and refutes the popular arguments against the privatization of rural land.

Keywords

land system; Household Contract System; lease; collective ownership; property rights; peasant private ownership

1. INTRODUCTION

Rural land is owned by the collectives. The collective-owned land is contracted (in essence, tenanted) and farmed by the collective members. The remaining (output minus rent minus taxes) goes to the peasants. This is main content of China's current rural land system (the Household Contract System). In the system, the peasant-owned exclusive residual claim¹ stimulates peasants' enthusiasm to work, which overcomes the members' shirking in the People's Commune (See section 3.1). In the 1980s, the system promoted a rapid increase in agricultural output, supporting the rapid growth of China's economy.

But since the late 1990s, China's current rural land system gradually exposed serious drawbacks, mainly including instability of the peasants' land use right and insecurity of income right weakening peasants' enthusiasm for investment in land, and a lot of restrictions on the transfer of peasants' land leases obstructing the flows and optimized allocation of labor, land and capital (See chapter 2). Much has been written about its drawbacks. Researchers have proposed different reform schemes on China's rural land system: first, the improvements to the current rural land system in the framework of the collective ownership. Some people advocate peasants' emphyteusis and transfer rights over the emphyteusis (Chi, 2002; Zhang, 2002; Dang, 2002). Some people propose to change the three-level (town, village, Village Group) collective ownership into the village collective ownership (Xiao, 1999; X. Zhang, 2013). Some people advocate Co-ownership by Shares (Han, 2004). Some people propose land stock cooperative system (the collective land is converted into shares of individual peasants; the peasants have the rights to income and transfer over land stock) (Shu, 2006; Wang, 2013). These improvements can, to varying degrees, ease but not eliminate the drawbacks of China's current rural land system fundamentally, for example, the collective violating peasants' land rights by virtue of its monopoly position in the Household Contract System (See section 2.1.2).

Second, nationalization and peasants' emphyteusis (Du, 2003, p. 207; Zhang, 2003; Zhou, 2004). Nationalization can greatly reduce the collective ability and chance to encroach peasants' land rights. Peasants' emphyteusis overcomes the instability of land use rights. But this system faces a multi-agent problem (governments at all levels exercise ownership on behalf of the state), while it may strengthen the government's role, and weaken the market's role in the allocation of land resources.

Third, privatization of rural land to peasants (Yang, 2002; Cai and Fang, 2005; Zhou, 2006, p.92; Wen, 2008; Yu and Chen, 2008; Qin, 2009). This proposal caused a great deal of misunderstanding and criticism.

In this article, we argue that the Household Contract System is essentially a lease where the collective (landowner) leases its land to its members to independently

1 As discussed in section 2.1.2 (2), in the system, the collective monopoly on rent formulation results in increasing land rent, which severely weakens the peasants' residual claim.

farm. The drawbacks of China's current rural land system (the Household Contract System) result mainly from the collective ownership and the government-run nature of the collective. Based on this understanding, we advocate the privatization of rural land to peasants.²

This article begins with an analysis on the drawbacks of China's current rural land system from the perspectives of contract, property rights and resource allocation. We then present and clarify our proposition on the reform of rural land system. Then we refute some of the arguments against the privatization of rural land.

2. THE DRAWBACKS OF CHINA'S CURRENT RURAL LAND SYATEM

Since the late 1990s, China's current rural land system exposed serious drawbacks.

2.1 Instability of the Peasants' Land Use Right and Insecurity of Income Right

2.1.1 Continuous adjustment of the peasants' Contracted Land

It's necessary to adjust the members' Contracted (Tenanted) Land and amend land leases with the changes in the collective population in a lease period, because the collective members have an equal right to contract (in essence, tenant) the collective-owned land. But this adjustment inevitably sacrifices the stability of the peasants' land use right. According to a survey in 2008, the peasants' Contracted Land of 63.7 per cent of the surveyed villages was adjusted during 1997 to 1999; and 34.6 per cent after 1999 (Dou, 2013).

2.1.2 Collective monopoly in the Household Contract System

With no competitors as the only lessor, the collective is in a monopoly position in the Household Contract System, which is mainly manifested in the following two cases. (1) Some collectives forced peasants (lessee) to transfer their land leases (land contract rights). According to a survey in 2011, 64.04 per cent of the leases where businesses rent peasants' Contracted Land were signed under the pressure of the village committee or township government (Ye and Tian, 2013).

(2) The collective monopoly on land rent formulation. Until 2006, peasants had to pay two kinds of fees: First, the clearly defined agricultural tax, which was canceled 1 Jan. 2006. Second, the ill-defined land rent, which seriously weakened the

2 The land for the rural public interest, such as the rural transportation and water conservancy facilities, is still vested in the rural collectives.

income rights of peasants. Statistically, in China from 1996 to 1999 the peasants' per capita fees (excluding volunteer work) amounted ¥ 126.60, ¥ 143.90, ¥ 152.80, ¥ 140.10 (L. Zhang, 2013), accounting for 13.26 per cent, 14.74 per cent, 15.87 per cent, 15.26 per cent of per capita agricultural net income of rural residents respectively (NBSC). And the burden on peasants in many regions is well above the national average. According to the survey of Cao (2000) on two villages in Yongxing County, Hunan Province, in H village per capita fees amounted to ¥ 179.01, accounting for 50.23 per cent of per capita agricultural income; in B village per capita fees amounted to ¥ 238.70, accounting for 69.18 per cent. In a competitive land tenure market, land rent is determined by the competition and negotiation between the lessor and the lessee. However, in the Household Contract System, the collective is a monopolist of rent formulation, while the peasant is just a recipient of land rent, which is why there has been an increasing land rent before 2006.

2.1.3 Government monopoly in supply of urban construction land and in land expropriation

Since the 1990s, the government's enclosing land has been intensifying for the following reasons. Firstly, most of the land whether for public interest or non-public interest in urbanization can only be the land expropriated by the government, because the collective land can not be transferred for non-agricultural construction (Article 63, Land Administration Law of the PRC). The legal restrictions on the purpose of the public interest of the expropriation (Article X, The Constitution of the PRC) are like an empty text.

Secondly, the benefit from the price difference between land expropriation and sale is the power of the government enclosing land. On the one hand, the collective land can not be transferred for non-agricultural construction. Any organization or individual can only apply for state-owned land to meet its or his demand for construction land (See Article 43, Land Administration Law of the PRC). These provisions establish a government monopoly on urban land, which leads to more expensive urban land. China's Land Resources Bulletin shows that China's urban land prices have been rising since 2001. The average annual growth rate of the average land price in major cities was 5.36 per cent from 2001 to 2012. The average land price in 105 major cities amounted to ¥ 3129/m² in 2012.

On the other hand, China's current rural collective is a government-run organization established by the government in the 1950s, not a free union of peasants. It is still largely subordinate to the government, though nominally self-governed so far, which determines the government monopoly in the expropriation of collective land, because a collective subordinate to the government can not (individual peasants without the right to freedom of association are less likely to) reciprocally negotiate with the government. The government monopoly in the expropriation of collective

land leads to a cheap land compensation. According to a survey in 2011, in the land expropriation the average compensation that the village collective got was ¥ 24,980/Mu (1Mu=666.7m²), landless peasants got only ¥ 17,256/Mu (Ye and Tian, 2013), only 3.21 per cent and 2.22 per cent of the average price that the government sold land respectively.

The government's growing enclosure of land has consequences. Firstly, it intensifies instability of the peasants' land use right. According to a survey, 43.26 per cent of the villages experienced land expropriation since 1995 (Ye and Tian, 2013).

Secondly, a lot of farmland is enclosed. A large number of peasants lose land and become unemployed refugees. The expropriated land only for the urban construction amounted to 20.97 million Mu (1.398 million hectares) only from 2004 to 2012 (NBSC), which caused landless peasants estimated at about 15 million. The transfer of employment is difficult for landless peasants because they are mainly elderly peasants with little education (in China today, most literate young peasants work in the city). According to the survey, the unemployment rate in the landless peasants amounts to 25.92 per cent (Xu, 2013).

Thirdly, illegal events and mass incidents occur frequently in the government's growing enclosure of land, endangering social stability. The lack of effective constraints on government results in a lot of illegal events in the expropriation, transfer, and the use of land. According to China's Land Resources Bulletin, 626,032 cases on illegal land use were found, involving 414,163 hectares of land, from 2006 to 2012. The criminal officials reached 3297 only in the special land inspection from 2007 to 2011. Peasants are often forced to take drastic measures, such as group resistance, to defend their rights because of government monopoly in the land expropriation. According to *Social Blue Book* published by China's Academy of Social Sciences in 2013, nearly half of tens of thousands of pieces of mass incidents in China each year resulted from the land expropriation.

Fourthly, cheap compensation in land expropriation leads to inefficient use of land. From the land productivity, statistically, Shenzhen, Shanghai, Guangzhou are ranked as the top three in China, but Shenzhen's just 1/5 of Singapore's, 1/10 of Tokyo's; Shanghai's just 7 per cent of Tokyo's, 24 per cent of Paris's, 27 per cent of Seoul's; Guangzhou's just 1/17 of Hongkong's, 1/18 of Singapore's, 1/32 of Seoul's (Yu, 2013).

Instability of the peasants' land use right and insecurity of income right above weaken peasants' enthusiasm for investment in land. According to a survey in 2011, only 30.11 per cent of the surveyed peasants made medium- and long-term investments in their Contracted Land (Ye and Tian, 2013).

2.2 China's Current Rural Land System Conflicting with the Optimized Allocation of Resource

In China's current rural land system, a peasant's right to contract (tenant) the collective-owned land is based on his status as a member of the collective (See Article 14, of Land Administration Law of PRC). If a peasant quits the collective and becomes a city resident with a non-agricultural household registration, he would have to freely return his Contracted Land to the collective, because he is no longer a member of the collective and has no right to contract the collective-owned land (See Article 26, Land Contract Law of PRC), which constitutes a cost of rural surplus labor to urban residents. Because of this cost, a lot of new city migrants from the countryside still retain agricultural household registration. In China in 2011, this population was about 311.5 million (the rural population was 656.6 million, while the population with agricultural household registration amounted to 968.1 million (NBSC)).

The right to transfer is a prerequisite for the optimal allocation of resource. The peasants' right to transfer their land leases is subject to a lot of constraints in China's current rural land system. (1) Agricultural use of land is not allowed to be changed in the transfer of the land leases. (2) The transfer deadline can only be limited to the remaining term of leases. (See Article 33, Land Contract Law of PRC). (3) Even without changes in agricultural use of land, the land lease can not be transferred without the consent of the collective (See Article 37, Land Contract Law of PRC), which gives space for the collective invading peasants' right to transfer. And the land lease can only be transferred to peasants (Article 41, Land Contract Law of PRC), which hinders the non-agricultural capital flowing to agriculture. (4) The land leases not in a same collective can not be interchanged, even if the interchange is helpful for farming (See Article 40, Land Contract Law of PRC), which hinders a decline in the cost of farming. (5) The land lease cannot be mortgaged (Article 184, The Property Law of the PRC), which limits the ability of peasants' financing.

These restrictions make the transfer of the land lease very difficult. And the transfer value is very low, because as mentioned, the peasants' land leases are in insecurity, facing the usurpation of the government, collective, and officials at any time (See section 2.1). A large number of peasant-workers go to town to work in agricultural slack season and come back to farm in agricultural busy season or simply let their Contracted Land barren, because they cannot find the transferee, or because the transfer value is too low. According to the survey, barren land accounted for 10 per cent of farmland in Hunan province in 2007, even 40 per cent in some villages, such as Binhu village in Hubei province (Yu, 2013). And the peasants' concurrent-business is very costly — the cost and time for going to town and back.

The expensive urban land resulting from the prohibition of the transfer of collective land for non-agricultural construction (See section 2.1.3) keeps up house

prices and rents in cities in China today, which raises the cost of living in the city and hinders the transfer of rural surplus labor. The average price of housing in China rose from ¥ 1948/m² in 2000 to ¥ 5429.9/m² in 2012 (NBSC); the price is much higher in big cities, such as in Peking - ¥ 16,553.5/m² in 2012 (NBSC), with an increase of about 178.7 per cent, and an average annual growth rate of about 14.9 per cent. In 2012, per capita disposable income of urban households - ¥ 24564.7 (NBSC) and per capita income of peasant-workers - ¥ 26988³ are only enough to buy housing of about 4.5m² and 4.97m² respectively if not used for consumption.

3. THE DIRECTION OF REFORM

The direction of reform of China's current rural land system is the peasant private ownership.

3.1 Abolishing Collective Ownership

Potential agricultural contracts include three categories: (1) wage contract, (2) fixed rent contract, (3) share contract (including input share contract, output share contract, and a mix of the both). The transaction cost of the three types of contracts is greatly increased, and their efficiency is reduced in the collective ownership of rural land compared with that in the private ownership of the land. In the agricultural wage contract (The People's Commune in China in the 1950s to 1970s can be seen as a wage contract in the public ownership of land and other important agricultural means of production⁴), it is difficult to measure the individual's labor contribution, because agricultural output is affected by many factors such as land, labor, climate and pests (Barzel, 1997, p.42-5). Accurately paying wages according to the labor contribution is impossible. Therefore, the members have a strong incentive to shirk. The effective supervision is a necessary condition for the efficiency of the agricultural wage contract. The supervisors having residual right is a necessary condition enough for the effective supervision. However, in the wage contract under the collective ownership of rural land, the incentive effect of the residual right for the supervisors is weak, because the residual right belongs to the collective, which results in a lack of supervision and an inefficient agricultural wage contract.

In the fixed rent contract, the peasants' enthusiasm to work is high, because they exclusively have the residual right (G. He, 2013), which overcomes the problems of high supervision cost and employee's shirking in the wage contract. But the pre-

3 Based on the average monthly income of peasant-workers in the third quarter of 2012 (NBSC).

4 The difference is that the contract is a voluntary relationship, but the People's Commune is a forced, not a voluntary association of members. The lifetime of members is under the control of the People's Commune. Therefore, the People's Commune is essentially a forced slavery. Nevertheless, it will be seen that the notion of contract is useful in analyzing the People's Commune.

ceding analysis shows that the lease in the collective ownership of land has serious drawbacks (See chapter 2).

In the collective ownership of land the share contract and the fixed rent contract have the same drawbacks because of the same factors, but the share contract is rare because its transaction cost is much higher than the wage contract's, and the fixed rent contract's in the modern.

The transaction costs of all possible agricultural contracts are higher, the benefits of land lower, and there is more rent dissipation in the collective ownership of land than in the private ownership of land. Therefore, abolition of the collective ownership of rural land is the requirement to improve the benefits of land and reduce the rent dissipation.

3.2 Privatization

The main reasons for privatizing rural land to peasants can be summarized as follows: (1) in the peasant private ownership, land rights are clear. And the peasants can protect their land rights from violations of the collective, government and officials in accordance with the law. Thus, they have enthusiasm to invest in the land.

(2) The right to transfer is a prerequisite for optimal allocation of resources. And assets that can be transferred free must be private property. In China today a large number of rural surplus labors, small-scale family-farming (diseconomies of scale), and lack of capital are the main obstacles to increasing the income of peasants and developing agriculture. Overcoming these obstacles is actually equivalent to optimal allocation of labor, land and capital. In peasant private ownership of land, the peasant-workers can sell or lease their land if they have this intention, which avoids the cost of peasants' concurrent-business (the cost and time for going to town and back) and the loss of barren land (net income of farming or rent). And the revenue from land sales or rent provides capital and security for peasant-workers. The right to transfer over land is particularly important for the peasants without the ability to work. The revenue from land sales or rent may be their most important, even only source of income. The peasants can get much-needed funds by selling or mortgaging land. Those peasants with a comparative advantage in agriculture can enlarge their farm through the purchase or lease of land. Non-agricultural capital can flow into agriculture through the purchase or lease of land. Thus, the rural surplus labors gradually flow from agriculture. Land is gradually concentrated to individuals and organizations with a comparative advantage in agriculture. The obstacles to increasing peasants' income and developing agriculture in China today are gradually surmounted. In addition, the peasants' right to transfer their land for non-agricultural construction freely in the peasant private ownership of land will break the government monopoly on urban construction land in the current land system, which will

help in reducing urban real estate land prices and rents (a cost of the transfer of rural surplus labor), and help the transfer of rural surplus labor.

Generally, there are two ways of privatizing rural land to peasants. One is to directly convert the tenancy right into ownership of peasants over their current Contracted Land, homestead, and Reserved Plots⁵. The other consists of two steps: to adjust the peasants' existing Contracted Land, and then to convert the tenancy right into ownership of peasants. As for which way to take, and how to adjust if the second option is selected, these issues should be left to peasants themselves to choose (Qin, 2009), for example, to decide by vote in the village.

3.3 The Government's Land Rights

The government's land rights mainly include the following aspects.

(1) The right to tax land. Taxing land is both an economic right of the government, and an important mean of the government to improve the efficiency of land use and reduce waste land. The government is entitled to re-introduction of agricultural tax if necessary, although agricultural tax is canceled in China on January 1, 2006. Moreover, the government can levy real estate tax, after the privatization of rural land. In urbanization, a large part of the land appreciation results from the government investment in urban infrastructure. A part of the appreciation, therefore, should go to the government. After the privatization of rural land, the government can get a part of the appreciation through the imposition of land transaction tax and VAT (Wen, 2008).

(2) The right to levy land. Some people believe that the private ownership of land may harm the public interest, because the landowner may charge the buyer too much in the land transfer for the public interest. Thus they oppose the privatization of rural land. Actually, this fear is not necessary, because in case that an agreement between the government and the owner could not be reached, the government can apply for court compulsory expropriation in the land expropriation for public interest.

Compared with the private right, the public right is strong. In the land expropriation, it is necessary to impose restrictions on the government's expropriation power to prevent the public power from damaging the private right. First, the government's expropriation of private land should be restricted to the purpose of public interest. Land outside the purpose of public interest should be allocated directly by the market. (Zhang, 2012)

Second, the government cannot deprive any person of life, liberty, or property, without due process of law. From foreign experiences, due process of law should be defined as follows: the land expropriation authority can issue a compulsory purchase order only after a public inquiry and hearing, and approved by the State Council; the

5 The Reserved Plots are the small plots of land left to the commune members to use in the long-term in the Agricultural Collectivization Movement in China in the 1950's. The peasants have the rights to lifelong use and income, but have no right to transfer over this part of the land. This part of the land is exempt from the rent and taxes. Its output is entirely owned by the peasant.

court has the power to review the legality of the exercise of the expropriation power; the dispute shall be submitted to the Land Court and subject to judicial judgment when a compensation dispute between the expropriation authority and the landowner appears and an agreement cannot be reached.

Finally, the government cannot expropriate any private property for public use, without reasonable compensation. The compensation should be exactly equal to all losses of the owner in the expropriation, in consideration of all relevant factors, including the use, history, market value of the land, increase in value resulting from the government investment, purpose of expropriation, et al.. This compensation must be higher than the compensation unilaterally decided by the government in the current land expropriation system (See section 2.1.3), which helps in saving land and improving the efficiency of land use. The restrictions on the purpose of land expropriation and the increase in costs of land expropriation can effectively curb the government enclosing land.

(3) The right to regulate land use. The government has the power to regulate the use of land for the public interest. The government mainly uses plan and law, including local and national plans and regulations of land use, environmental regulations, building regulations, et al., to regulate the use of land.

(4) The right to inherit the real estate without successor. The real estate without legal successor goes to the government on the death of its owner.

4. MISUNDERSTANDINGS OF THE PRIVATE OWNERSHIP OF RURAL LAND

Misunderstandings of the private ownership of rural land are a major obstacle to privatization. They mainly come from the following aspects.

4.1 The Relation between the Private Ownership of Land and Social Stability

The opponents of the privatization of rural land to peasants, such as Wen (2013), Jian (2013), and et al., believe that once the rural land is privatized to peasants, a large number of peasants may sell their land due to moving into the city in search of work (some may sell their land in great need of funds; some without the ability to work may live on the revenue from land sales; some may even sell their land because of laziness). Once they fail to find work and run out of their savings, these landless peasants will become unemployed refugees who may endanger social stability. Opponents therefore argue that the peasant private ownership of rural land is harmful, and oppose the privatization of rural land to peasants.

This view is baseless. It asserts that the peasants are irrational and lack the capacity to make decisions. Actually, most peasants will not blindly sell their land in the

peasant private ownership of land precisely because they are rational. The choice is a trade-off for a rational peasant. If he chooses to sell his land, it shows that he has no other better choice. The peasants who sell their land because of laziness are rare. A rational peasant may sell his land only when there is a comparative advantage in non-agricultural industries compared with that in agriculture, and only when he believes that he will have a stable non-farm income sufficient to sustain his life in future. The free trade of land in the private ownership of land, therefore, may bring unemployed refugees, but not quite a lot. Moreover, unemployed refugees should get social assistance, unless the reason is laziness. Thus, the fear that the free trade of land in the private ownership of land may bring a large number of unemployed refugees, thus threatening social stability, is misplaced. The opponents of the privatization of rural land to peasants also often prove their aforementioned view by using the following historical theory: peasant wars in China's history are essentially landless peasants' revolution against landowners to get land; the free trade of land in the private ownership of land resulted in a large number of landless peasants. According to Qin (2001, 2007), this theory is inconsistent with historical reality. Firstly, peasant wars in China's history mainly resulted from the rulers' heavy exploitation (taxes) of small- and medium-sized landowners. The main participants in peasant wars were mainly small- and medium-sized landowners rather than landless peasants. Secondly, the main reason for a large number of peasants selling their land was unbearable heavy land tax. Purchasers of land were mainly the tax-free privileged class.

4.2 Security Function of Land

Some opponents of the privatization of rural land to peasants argue that China's current rural land system plays an important role in security for peasants. For example, unemployment peasant-workers can return to the countryside to farm (the equivalent of unemployment insurance); older peasants can live by farming (the equivalent of old-age security). However, a large number of peasants may sell their land, losing security, once the rural land is privatized to peasants (X. Zhang, 2013). This view is wrong. First, China's current rural land system does play some role in security for peasants, but no one can deny that the peasants should enjoy equal social security with urban residents. Second, as mentioned, the peasant private ownership of rural land will not result in a large number of peasants selling their land blindly. The third, in China's current rural land system, a lot of constraints on the peasants' right to transfer their land leases make the transfer very difficult and the transfer value very low, which severely limits the security function of land to peasants. Poor peasants cannot get much-needed medical funds by transferring their land leases. Those peasants without the ability to work cannot live on the revenue from the transfer of land leases. The fourth, the security function of land to peasants does not exclude the peasant private ownership of land; on the contrary, it requires the peasant

private ownership! In the peasant private ownership, poor peasants can get much-needed medical funds by selling or mortgaging their land, and the peasants without the ability to work can live on the revenue from land sales or rent. Finally, it is necessary to control land in peasants' hands to restrict the collective, government, and officials from violating their land rights, precisely because land is important for most peasants in China today (Qin, 2009).

4.3 The Relation between the Private Ownership of Land and the Interests of Peasants

Some opponents of the privatization of rural land to peasants believe that with the expansion of peasants' land rights, reaching an agreement on rural public goods among peasants becomes more difficult. The expansion of peasants' land rights, therefore, would undermine the rural collective ability to provide public goods for peasants and harm the interests of peasants (X. He, 2013). Whether it is so or not, it is necessary to perceive the practical role of the collective in China's current rural land system. In China today, the rural collective is a government-run, not autonomous organization, whose main responsibility is to execute government decisions such as assisting the government in land expropriation. Although some rural collectives may provide some services, such as market services, technical services, and et al. for peasants, their role in this area is weak. Moreover, as mentioned, the rural collective often violates peasants' land rights. The peasant private ownership of rural land can curb the government, collectives and officials from violating peasants' land rights (See section 3.2). It is therefore helpful to peasants in general, even though it can weaken the collective ability to provide public goods for peasants. Moreover, the collective is not an efficient organization to provide rural public goods. Peasants can cooperate to provide public goods on their own. Provision of rural public goods is also an important duty of the government.

4.4 The Relation between the Private Ownership of Land and Farmland Preservation

Some opponents of the privatization of rural land to peasants believe that the peasant private ownership can lead to excessive farmland for non-agriculture, endangering food security (X. Zhang, 2013; Jian, 2013). This fear is not necessary. In China today the main cause of many non-agriculture farmlands is government's enclosing of land, not the peasants' using or transferring farmlands freely. The peasant private ownership of rural land can curb the government enclosed land (see section 3.2), and is helpful for the protection of farmland and food security. Meanwhile, the market can effectively allocate land between agriculture and non-agriculture. If excessive land for non-agriculture results in the shortage of agricultural products, the

price of agricultural products will rise and that will automatically curb the land used for non-agriculture. In a market economy, the government should improve the value of land for agriculture by using agricultural subsidies to protect farmland, not simply to restrict, or even deprive the peasants' rights to use and transfer land.

5. CONCLUSION

The Household Contract System based on the collective ownership is the main content of China's current rural land system. It is essentially a lease where the collective (landowner) leases its land to its members to independently farm. The peasant-owned exclusive residual claim in the lease stimulates peasants' enthusiasm to work, which overcomes the members' shirking in the People's Commune. The Household Contract System, therefore, is efficient compared with the People's Commune.

But since the late 1990s, China's current rural land system gradually exposed serious drawbacks, mainly including instability of the peasants' land use right and insecurity of their land income right weakening peasants' enthusiasm for investment in land, and a lot of restrictions on the transfer of peasants' land leases obstructing the flows and optimized allocation of labor, land and capital.

The drawbacks of China's current rural land system result mainly from the collective ownership and the government-run nature of the collective. The improvements to this system in the framework of the collective ownership, therefore, can not eliminate the drawbacks of this system fundamentally, and may make land ownership more unclear, and the transaction cost higher. And the state ownership of rural land faces multi-agent problem (governments at all levels exercise ownership on behalf of the state), while it may both strengthen the government's role, and weaken the market's role in the allocation of land.

Direction of the reform of China's current rural land system is the peasant private ownership. In the peasant private ownership, land rights are clear. And the peasants can protect their land rights from violations of any organization or individual in accordance with the law. Thus, they have enthusiasm to invest in land. Moreover, the right to free transfer over land is a prerequisite for optimal allocation of land, labor and capital resources (land flowing to individuals and organizations with a comparative advantage in agriculture; labor and capital flowing between agriculture and non-agricultural industries). And the land that can be transferred free must be private land.

The misunderstanding of the private ownership of land and the resistance from the vested interests in the current rural land system are the main obstacle to privatize rural land. The reform cannot come and succeed, until the strength of the supporters of the reform is over opponents'. Currently, it is necessary to carry out a broad discussion on the reform of the land system in order to accumulate strength to privatize rural land. In the discussion there will be more people (especially the decision-mak-

ers) to recognize the necessity and feasibility of rural land privatization, and to become the supporters of the reform. With the rise of supporters' strength, even some vested interests in the current rural land system may also support the reform due to pressure or the awareness of the reform trend.

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REFERENCES:

- Barzel, Y., *Economic Analysis of Property Rights*, Chinese version (translator: F. Fei and Y. Duan). Shanghai: Shanghai People's Publishing House, (1997)
- Chi, F., *Giving Peasants Land Use Rights*. Peking: China Economic Press, (2002)
- Cai, J., Fang., C., "A Comparative Analysis of the Schemes of Rural Land System Reform", *Social Science Research*, 4, (2005): 28-32
- Cao, L., "A survey on peasant's burden", *The World of Survey and Research*, 11, (2000): 28-30
- Dang, G., "Market-oriented Reform of the Rural Economic System", *China Rural Survey*, 4, (2002): 72-9
- Du, R., "Resource Endowments—the Contradiction between Population and Land—Determine China's Rural Land System", in *China in Transformation*, Peaking: Social Science Academic Press (2003)
- Dou, X., "An Exploration on Innovation of China's rural Land System Based on the Perspective of the Rights", *Theoretical Investigation*, 1, (2013): 94-7
- Han, J., "Attaching the Property Rights to Peasants' Contract Rights", *Guangming Daily*, Jul 27, 2004.
- He, G., "The Rise and Fall of Serfdom in China: A Theory of Institutional Change", *Economic History of Developing Regions*, 28(1), (2013): 69-86
- He, X., "Reply to Professor Zhou Qi-ren on Logic of Land Ownership", *Journal of Huazhong Agricultural University (Social Science Edition)*, 3, (2013): 1-9
- Jian, X., "An Analysis on the land privatization in China", *Contemporary Economic Research*, 1, (2013): 17-25
- NBSC (National Bureau of Statistics of China), Per capita agriculture net income of rural residents, People's lives; The Area of the Expropriated Land, Urban Construction, City Overview; Total Population; Rural Households and Rural Population, Agriculture; Average Price of Housing Sales Based on Use of Housing, Investment in Fixed Assets and Real Estate; Per Capita Income of Urban Households and Engel Coefficient, People's Lives; Peasant-workers, People's Lives. <http://data.stats.gov.cn/workspace/index.jsessionid=02FB31F69E988949CE6B65D4BC762F8D?m=hgnd>
- Qin, H., "On Land Problems", *The Economic Observer Newspaper*, Feb 9 (041), (2009)
- Qin, H., "Optimal Allocation and Land Benefits", *The new Finance and Economics*, 9, (2001): 66-7
- Qin, H., "A discussion on some problems of traditional tenancy system", *China Rural Survey*, 3, (2007): 27-40
- Shu, J., "On How to Overcome the Drawback of the Ill-defined Owners of Rural Collective Land", *Journal of the Party School of the Central Committee of the C.T.C.*, 3, (2006): 47-50
- Wang, R., "Urbanization and the Reform of China's Rural Land Property System", *Journal of the Party School of the Central Committee of the C.T.C.*, 17(1), (2013): 89-92
- Wen, G. J., "Market Deformity, Social Conflict and the Current Land System", *Comparative Economic & Social System*, 2, (2008): 45-51
- Wen, T., "Why can't rural land be privatized in China", *Gansu Agricultural Sciences*, 3, (2013): 10-11
- Xiao, F., "Defects and Improvement of the Collective Ownership", *Peking University Law Journal*, 4, (1999): 86-90

- Xu, Q., "A policy suggestion on promoting employment of landless peasants in urbanization", *Scientific Development*, 2, (2013): 24-27
- Yang, X., "Xiaokai Yang's Talk with Rushan Jiang: Deep Problems Faced by China's Reform: the Reform of Land System", *Strategy and Management*, 5, (2002): 1-5
- Yu, J., Chen, Z., "Returning Peasants the Land Rights", *Southeast Academic Research*, 2, (2008): 12-8
- Yu, M., "The land waste should be curbed", *Finance & Economy*, 4, (2013): 7-9
- Ye, J., Tian, C., "The Status of China's Rural Land Rights: Contract Structure, Institutional Change and Policy Optimization", *Journal of Huazhong Normal University (Humanities and Social Sciences)*, 52(1), (2013): 38-46
- Zhang, H., "Changes in China's Rural Land System", Peking: China Agriculture Press, (2002)
- Zhang, X., "On the Reform of China's Rural Land Ownership Based on Civil Law", *West Forum*, 23(1), (2013): 11-6
- Zhang, D., "On the New Land Tenancy System", *Forward Position in Economics*, 4, (2003): 36-8
- Zhang, L., "The peasants' burden and financial support for agriculture", *Sub National Fiscal Research*, 4, (2013): 16-22
- Zhang, M., "Alienation and Restriction of the State Eminent Domain", *Hebei Law Science*, 30(10), (2012): 61-7
- Zhou, T., "Comparison and Selection of the Schemes of Rural Land System Reform", *China Economic Times*, Feb 26.2004.
- Zhou, Q., "Income Is a Series of Events", Peking University Press, (2006)

CORRELATION BETWEEN THE PENETRATION STRATEGIES AND MARKETING MIX OF INTERNATIONAL HOTEL CHAINS IN ROMANIA

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ABSTRACT

On the Romanian market there are 21 international hotel chains, having 51 hotels. The goal of the research paper is to analyze which are the marketing mix policies and strategies used by the hotels, belonging to an international hotel chain on the Romanian market. For this purpose, a descriptive research was implemented through investigation of all the hotels that are part of an international hotel chain. The research reveals that hotels operate by abiding the norms established by contract. The higher the risk, the investment and control are, the more influence the hotel chain has regarding the pricing strategies. Hotels use their own channels but also the parent chain channels. Promotion strategy takes into account global, regional and local issues encountered. The majority of the hotels have the possibility to decide some internal elements for their personnel. All the hotels apply norms and standardized procedures regarding the quality of the services. The most expected advantage for a hotel that belongs to an international chain is the visibility at international level.

Keywords:

international hotel chains, hotel strategies, marketing mix strategies,
international hotel

1. INTRODUCTION

Hotel industry is one of the biggest and most competitive industries in the world. The current size of the hotel industry is challenging to quantify, but nonetheless, it demonstrated tremendous growth during the last quarter of a century (Jones, Hillier and Comfort, 2014). The hotel industry is viewed not only as one of the most globalized service sectors, but also as a prime actor in the development of globalization around the world (Yu et al., 2014). At the international level hotel market is characterized by take-overs, consolidations and expansions (Călăreţu, 2011). As growth rates slow in the developed markets hotels are turning their attention to new and emerging markets in order to develop their businesses. Because of the favorable political climate and economic opportunities, in the last 25 years the hotel industry from Central and Eastern Europe faces with a significant expansion of the local hotel markets and operations of the international hotel chains.

Many of the international hotel chains use a mix of penetration strategies to expand into foreign markets. They are combining the foreign direct investment through acquisitions and constructions with the leased contract, the franchise, the management contract or even joint venture, based on the interest that they have in a specific country or based on the policies and regulations applied in that country (Bradley, 2001: 281; Johansson, 2006: 127-129; Guillet, Zhang and Gao, 2011).

Hospitality customers seek familiar services, which allow them to move easily between countries (Cline, 2002). International hotel chains often use synchronized marketing strategies, similar tangible and intangible services, and standardized environment and services for all of their locations (Aliouche and Schlentrich, 2011; Sutthijakra, 2011). Furthermore, after entering into a market, some of the hotel chains are using a standardized marketing mix and sell almost the same products, having the same marketing approach as in the rest of the world. These hotels benefit from scale economies and concentrate in marketing activities. Other want to make a difference between the markets and to adapt all the marketing mix elements to the desires and needs specific to the market that they would like to penetrate (Wilson and Gilligan, 2005: 319). Thus, globalization leads to standardization of services and processes within the hospitality industry. Standardization does not mean that a service is delivered in a strict mechanical way (Wilson, Zaithaml, Bitner & Gremler, 2012), but on the contrary, standardization is a way to perform according to the expectations of customers. The importance of standardization is underlined by Wilson et al. (2012) because in hotel industry it is important to ensure the same level of service to all customers. Customization, as a process of delivering unique service in terms of types and quality, is regarded as a deliberate strategy for the hotel actors and can be used a way to adapt to the historical, and geographical particularities of a given market (Lee, 2011; Yu et al., 2014). Customization also is common for business-to-business level of service transactions (Wilson et al., 2012).

Several studies investigated different entry and growth strategies implemented by the hotel chains for international markets, but there is a gap in the area of academic knowledge regarding marketing strategies used for emerging markets from Central and Eastern Europe. The goal of the paper is to identify and analyze if the marketing mix policies and strategies are adapted or standardized to the penetration strategies. The marketing mix variables considered in the present study are those proposed by Booms and Bitner. They had added to the classical elements of the marketing mix (product, price, place and promotion) other three elements for services industry: people, process and physical evidences (Booms and Bitner, 1980).

The present research investigates the Romanian hotel market. At this moment, on the Romanian market there are 21 international hotel chains, having 51 hotels (3,6% form the total hotel market). Also, these chains belong to international hotel groups (Cosma, Fleşeriu and Bota, 2014).

2. METHODOLOGY

The paper is based on a wider marketing research that aims to identify the perceptions and actions of hotels running under the umbrella of a hotel chain, upon the tourism industry in Romania. For this purpose, a descriptive research was made to identify the internal and the external factors that have an influence upon the activity of international chains as well as the marketing policies they use. As a research method, the investigation was performed. The interview for data collection was performed in all three forms: face to face, by telephone and by mail. The investigated population has included 51 research units, representing all the hotels from Romania that are part of an international hotel chain (100%). For information accuracy, the research had an overall character, though the opinion poll was excluded. Involving an elaborate data collection and processing work, the research lasted about three months and was conducted at the end of year 2013 and the beginning of the year 2014.

As data collection instrument it was used a questionnaire made up of 25 questions that wanted to identify several issues concerning the reason for which the hotels belonging to international hotel chains in Romania have decided to run under the umbrella of a certain brand making use of a certain penetration strategy as well as issues regarding the marketing strategies applied to the Romanian market. It has been tested if the chosen penetration strategy has a significant influence on the level of standardization or adaptation in respect with the marketing mix strategies implemented by hotels. As the variables considered are categorical nominal qualities, as statistical analysis instruments Chi and Cramer V were considered. The software applied for analysis was SPSS.

This paper capitalizes only a part of the data collected in this marketing research. The main purpose is to identify if the chosen penetration strategy has a significant

influence on the marketing policies and strategies implemented by the hotels belonging to an international hotel chain in Romania.

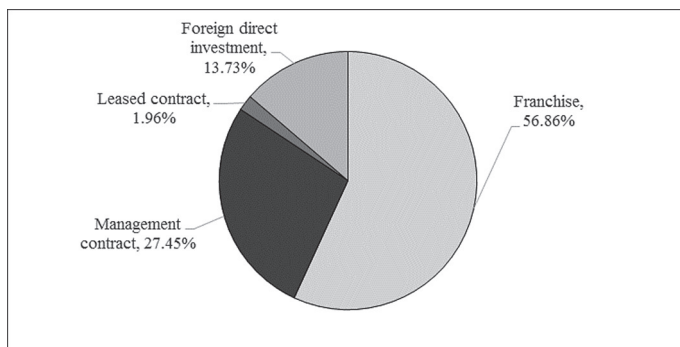
The research objectives are as follows:

- (1) To identify the way in which the hotels operate after running under the umbrella of a hotel chain.
- (2) To identify the balance between standardization and adaptation of implemented marketing mix strategies of the hotels belonging to an international chain in Romania.
- (3) To study the correlation between penetration strategies and different marketing mix strategies.

3. RESULTS AND DISCUSSIONS

Penetration strategies used by all international hotel chains in Romania (% from the total number of hotel chains) are presented in Figure 1. The strategies used most often by international hotel chains to penetrate a foreign market are the franchise and the management contract (Erramilli, Agarwal, Dev, 2002; Guillet, Zhang, Gao, 2011) and this pattern can be identified also on the Romanian market. More than 50% of the hotels (29) are franchises, 14 of them are functioning under a management contract, 7 hotels are foreign direct investments and in Romania exists just a hotel which has a leased contract.

Figure 1.: Penetration strategies used by international hotel chains to enter the Romanian market



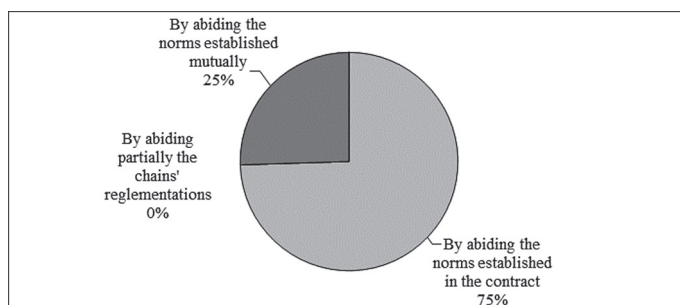
Source: Author's calculation

When entering a new market, the internationalization strategy chosen by hotels vary, being influenced by the amount of financial involvement, the level of desired operational control and the level of assumed risk (Chen and Dimou, 2005; Cristureanu, 2006). The chains which use as penetration strategies the foreign direct investment and the management contracts will want to have a high operational control and

those with franchises will want to have an average one (Contractor and Kundu, 1998; Cristureanu 2006).

In Romania, the majority of the hotels belonging to international hotel chains are franchises or use management contracts. As a result of the analyse made for all the 51 hotels, belonging to the 21 international hotel chains present on the Romanian market, 38 are continuing the activity by abiding the norms established in the contract and 13 by abiding the norms established mutually with the international chain (Figure 2.).

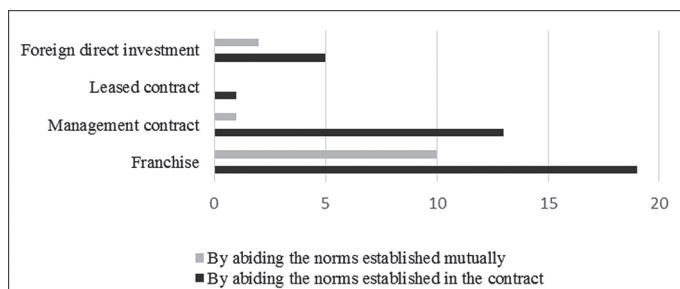
Figure 2.: Hotels' ways of operating after entering into an international chain



Source: Author's calculation

Analyzing this result in correlation with the penetration strategies used by the international hotel chains on the Romanian market, from all the hotels that operate by abiding the norms established in the contract, 19 are franchises, 13 use as penetration strategy the management contract, there is a leased contract and 5 foreign direct investments. From those hotels which operate by abiding the norms established mutually, 10 are franchises, one is a management contract and there are two foreign direct investments (Figure 3.).

Figure 3.: Penetration strategies used by the hotels that belong to an international hotel chain



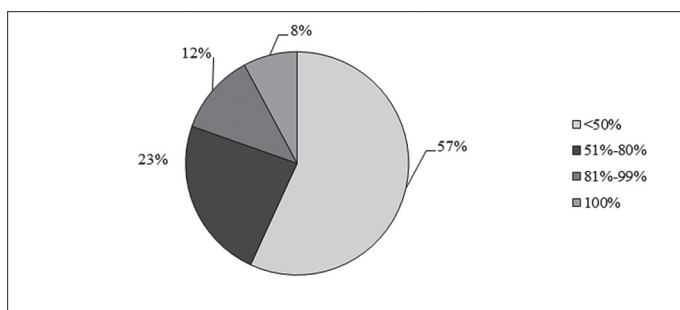
Source: Author's calculation

The study revealed that the management contracts involve more imposed norms. From these 51 hotels belonging to international chains, 40 are offering services based on the contract regulations, 31 depending on the particularities of each structure and 7 based on the negotiated results.

The services' quality is evaluated using questionnaires addressed especially to the clients. The questionnaires are also addressed to the employees and to the business partners. The evaluation is considered when the hotel decides, but also when the international chain wants that.

Regarding the financial investment of hotel chains, those which use as penetration strategy the foreign direct investment have a high financial involvement, those that use management contracts have a low one and those with franchises will have an average one (Contractor and Kundu, 1998; Cristureanu 2006). Because of that, the hotel chains will influence in a different way the hotels, how to establish their prices. 29 hotels have the pricing strategies set less than 50% by the international chain, 12 hotels established between 51%-80%, 6 hotels between 81%-99% by the international chain and 4 that have the prices established 100% by the international chain. From those which have the biggest freedom of decision, 27 are franchises, one is management contract and one foreign direct investment. From those 12 hotels, which have the pricing strategies established between 51%-80% by the international chain, 8 are using the management contract, 2 are franchises and 2 are foreign direct investments (Figure 4.).

Figure 4.: Pricing strategies used by the hotels belonging to international chains

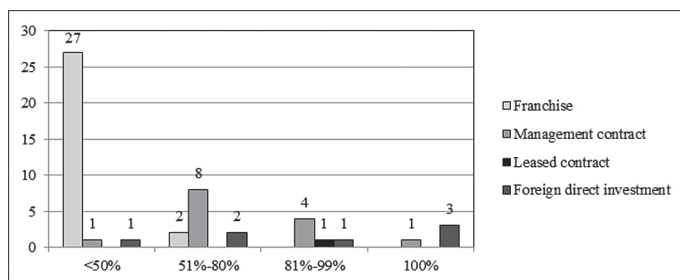


Source: Author's calculation

It can be observed that the majority of the hotels which are implementing the pricing strategies established less than 50% by the international chain are franchises (93%). This happens because the international chain doesn't have a very high financial involvement, and in this case the franchisor wants to get the franchise fee. If the pricing strategies are established between 51%-80% or between 81%-99%, the predominant penetration strategy is the management contract (67%). In this case, the hotel chains want to have the same standards and similar pieces in all the hotels, all over the world. When the pricing strategies are established 100% by the chain,

in this situation it is the foreign direct investment the predominant strategy (75%) (Figure 5.). The explanation is that the chains have a high financial involvement, and because of that they will take the decisions.

Figure 5.: Distribution of pricing strategies depending on the penetration strategies used by each hotel that belongs to an international chain

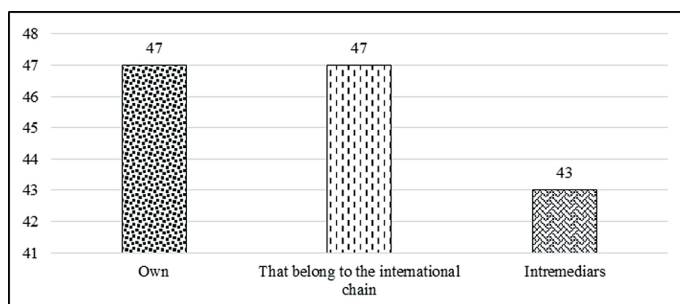


Source: Author's calculation

Using the coefficients Phi and Cramer V the research wanted to study if there is a connection between the penetration strategy and the strategies for the extended marketing mix elements used by each hotel. The null hypothesis is: „The extended marketing mix elements used by the hotels belonging to international chains are not influenced by the penetration strategies used in this country”. In respect with the price, the Cramer V coefficient is 0,587 and the research reveals a strong correlation between these variables. Because $p < 0,001$ the correlation between the penetration strategy and the pricing strategy used by each hotel is statistically significant. For the rest of the marketing mix elements were obtained values statistically insignificant.

Hotels use both own distribution channels and the channels belonging to the parent chain, and intermediaries also (Figure 6.). In this case, the hotels will use both standardized channels but also will adapt to the market.

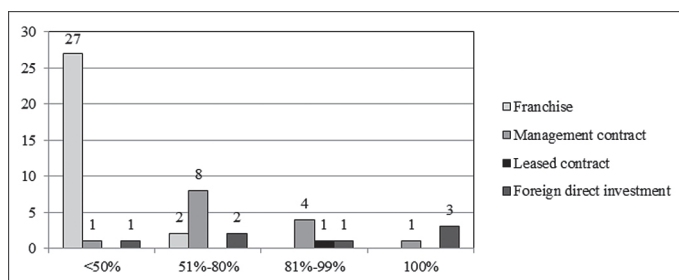
Figure 6.: Distribution channels used by hotels belonging to international hotel chains



Source: Author's calculation

Among the hotels that use their own distribution channels, 27 have a franchise contract, 14 a management contract, 5 are foreign direct investment and one leased contract. Channels belonging to the parent chain are used by 27 franchised hotels, 13 operate under management contract, 6 are foreign direct investment and there is also one leased contract. 24 franchised hotels, 12 hotels operating with a management contract, 6 foreign direct investment and one leasing contract use intermediaries in distribution strategy (Figure 7.).

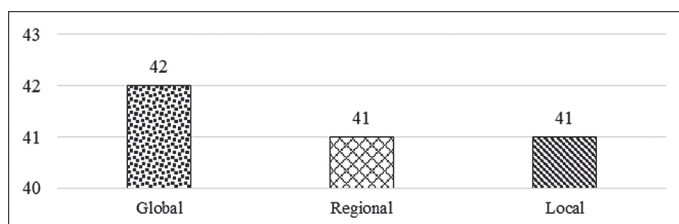
Figure 7.: Distribution channels used by the hotels correlated with penetration strategies



Source: Author's calculation

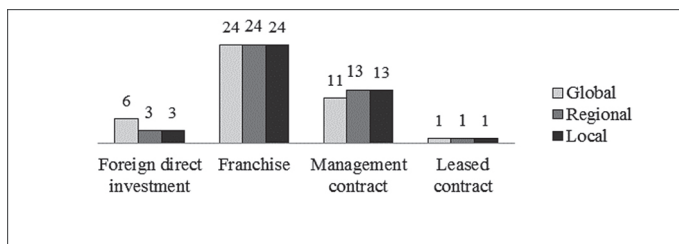
Global promotion strategies are implemented in 42 hotels, regional strategies by 41 and local promotion strategies also by 41 hotels (Figure 8.). These promotion strategies are used by the hotels to address themselves to consumers at international level, but also at national one.

Figure 8.: The promotional activities level of implementation used by hotels belonging to international hotel chains



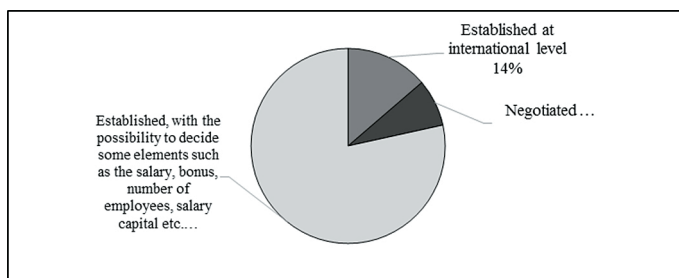
Source: Author's calculation

The obtained results correlated with penetration strategies used by the hotels are presented in Figure 9. From all 51 hotels, 30 underlined they use all three ways of promotion. Among them 18 are franchises, 9 operating under a management contract, there are 2 foreign direct investments and one leased contract.

Figure 9.: Promotion strategies used by hotels correlated with penetration strategies

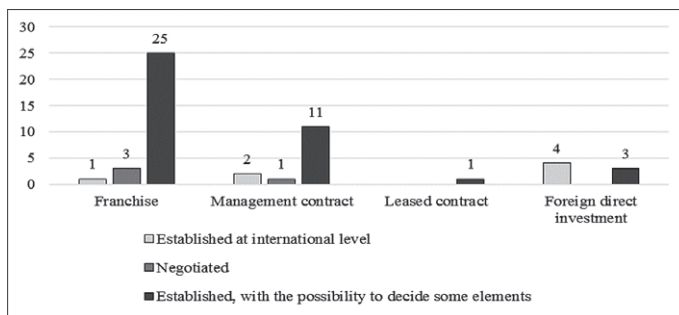
Source: Author's calculation

About the human resources policy, the majority of the hotels (40) have the possibility to decide some elements such as the salary, bonus, number of employees, salary capital etc. 7 hotels have established it at international level and just 4 have negotiated (Figure 10.).

Figure 10.: The human resources policy used by hotels belonging to international hotel chains

Source: Author's calculation

From the 40 hotels, which are having an established human resources policy, but with the possibility to decide some elements, the majority are franchises (25 hotels). Also, almost all the hotels that have a management contract use this policy (11 hotels from 14). There are 3 foreign direct investments and one leased contract (Figure 11.).

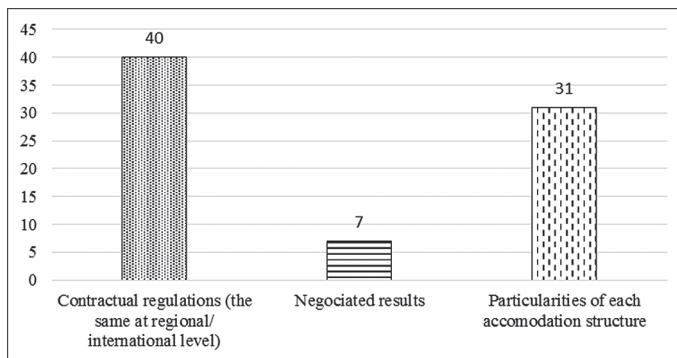
Figure 11.: The human resources policy used by hotels correlated with penetration strategies

Source: Author's calculation

The potential risk is also a very important criterion, taken into consideration by the hotel chains. Those chains that use foreign direct investment as penetration strategy have a high potential risk, those that use management contracts have a low one and those with franchises will have an average one (Contractor and Kundu, 1998; Cristureanu 2006). Because of that, the hotel chains will be involved in the decision making process.

Regarding the ways of establishing the offered services, 40 of the hotels have contractual regulations. From those 40 hotels, 20 take into consideration also the particularities of each accommodation structure and 4 hotels have also negotiated results (Figure 12.).

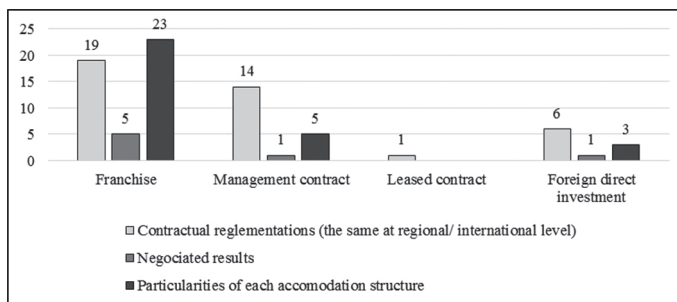
Figure 12.: Ways of establishing services offered by hotels belonging to international hotel chains



Source: Author's calculation

Among the hotels that use contractual regulations, 19 are franchises, 14 have a management contract, one a leased contract and 6 are foreign direct investments (Figure 13.). It is clear to observe the fact that 70% from the hotels operating with a management contract have contractual regulations (the same at regional/ international level) and that is happening because the hotel chain wants to have the same quality of services all-over the world.

Figure 13.: Ways of establishing services offered by hotels correlated with penetration strategies

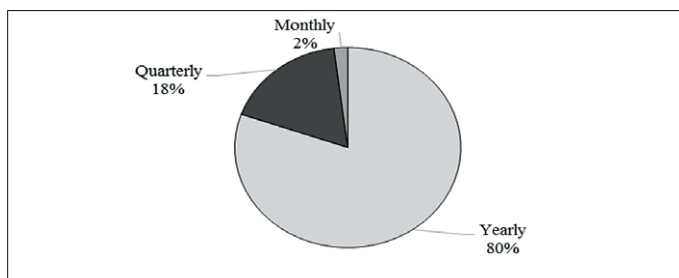


Source: Author's calculation

The study reveals that all the 51 hotels apply norms and standardized procedures regarding the quality of the services.

From all 51 hotels belonging to an international chain, 41 have an internal audit yearly, 9 of them just quarterly and just one hotel has it monthly (Figure 14.).

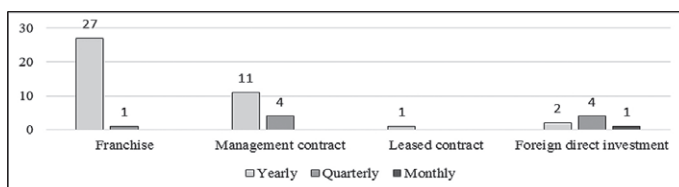
Figure 14.: Periodicity of the internal audit in hotels belonging to international hotel chains



Source: Author's calculation

More than a half (57%) from the hotels which are foreign direct investments have the internal audit more than one time each year. This is happening because the chains which have entered on the Romanian market with this penetration strategy are small ones, with not so many hotels and with the possibility to verify more often the hotels (Figure 15.). Regarding the internal audit for the franchises, just one hotel has the quarterly, all the rest have it yearly.

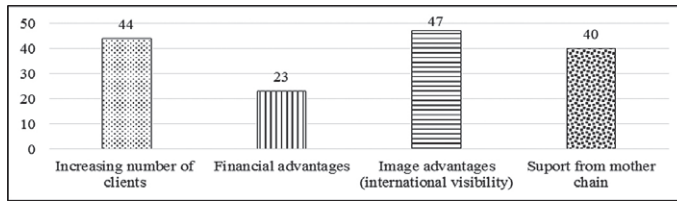
Figure 15.: Periodicity of internal audit in hotels correlated with penetration strategies



Source: Author's calculation

Almost all the hotels (47 hotels) belonging to an international chain think that the international visibility is an important advantage. Also, the increasing number of clients and the support given by the mother chain are also advantages taken into consideration by a hotel who wants to be part of an international chain. Just 23 of the hotels consider that belonging to a chain offers some financial advantages (Figure 16.).

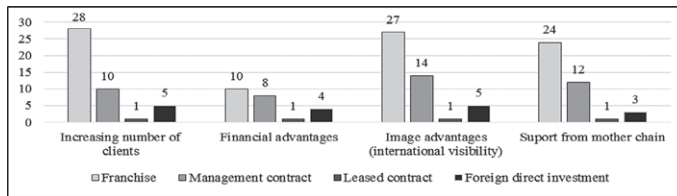
Figure 16.: Advantages of belonging to an international hotel chain



Source: Author's calculation

Regarding the correlation between the penetration strategies and the advantages of belonging to an international chain, there is a significant difference for the franchises. 28 from the franchised hotels consider an advantage the increasing number of clients, 27 the international visibility, 24 the support from the mother chain but just 10 of them consider that belonging to an international chain will bring them financial advantages (Figure 17.).

Figure 17.: Advantages of hotels belonging to an international hotel chain correlated with penetration strategies



Source: Author's calculation

4. CONCLUSION

The majority of the hotels belonging to international hotel chains present on the Romanian market are franchises and management contracts. Most hotels in Romania, after entered under the umbrella of an international chain, operate by abiding the norms established by contract. From these, most are franchises. This is why the products/ services are agreed based on contractual regulations, and taking into account the peculiarities of the existing structure.

Regarding the pricing strategies, the situation is slightly different. Thus, most franchised hotels have the pricing strategies set by the parent chain at a rate of less than 50%, because this type of strategy does not involve a high control and risk for the international chain. The higher the risk, the investment and the control are the more hotel chain influences pricing strategies. If one consider management contract, the parent chain can influence pricing strategies at a rate

between 51% - 80%. If the hotel chain influence in formulating pricing strategies is 100% than the hotel works as foreign direct investment.

In terms of distribution strategy, hotels belonging to international chains use their own channels but also the parent chain channels. Hotels address both Romanian customers and foreign ones. Finally, hotels can use intermediaries too.

The promotion strategy takes into account global, regional and local issues encountered. In this respect, the implementation takes particularly into account the specificities of local tourism demand, but also those of foreign tourism demand.

Regarding the personnel, the majority of the hotels have the possibility to decide internal elements such as the salary, bonus, number of employees, salary capital and so on. This situation is present in almost all the hotels that have a management contract (11 hotels from 14).

In terms of process, the study reveals that all the 51 hotels apply norms and standardized procedures regarding the quality of the services. The majority of the hotels have contractual regulations (the same at international/ regional level).

The study shows that the most expected advantage for a hotel that belongs to an international chain is the visibility at international level. Hotels consider this image advantages as being some physical evidences incorporated in their offer.

Were tested correlations between the penetration strategies and the extended marketing mix strategies in order to identify connections between these variables. It has been statistically proven that the pricing strategies represent the only variable influenced by the penetration strategies.

The research reveals that the strategies for products, processes and some elements incorporated in physical evidences can be considered mainly standardized, while, variables like pricing, distribution, promotion and personnel are mainly adapted to the foreign market expectations and requirements.

The present study regarding the marketing mix strategies used by the hotels in Romania belonging to international chains has some limitations that can turn into future research. The most important limitation is related to the small number of questionnaires implemented. The investigated population has included just 51 research units, which are for the moment all the hotels from Romania that are part of an international hotel chain.

The research offers a support in understanding perceptions and actions of hotels running under the umbrella of a hotel chain, upon the tourism industry in Romania, but it is impossible to extend the results to other countries or at regional or international level. Another important limitation appears because of the people that answered to this questionnaire. The questionnaire was applied also per email and for those situations it is impossible to be sure if the hotel managers answered.

Nevertheless this research expands the theoretical knowledge about the Romanian hotels industry, with a main focus on the marketing mix strategies of international hotel chains. Moreover, the findings of this paper are beneficial for local businesses and also for international hotel chains as providing a practical insight on

how companies operate in the Romanian market in relation to their competitors. In addition to filling a research gap in the academic field, the study contributes with practical implications for hotel managers in terms of penetration and marketing mix strategies for international hotel chain.

However, there is space and need for further research on the related topic. Moreover, the hotel industry in Romania is constantly changing and developing, as new local units and international hotel chains are entering the market. Therefore, the competition on the Romanian market will continue to grow determining marketing decisions to become more important for the performance of the hotels. Some future research might concentrate more precisely on what local factors of the Romanian market are taken into consideration by hotels when deciding whether to develop standardized or customized strategies and also combining both customers' and companies' perspectives on marketing strategies within the market. Also it will be important to find out if the international hotel chains are using the same marketing mix strategies in other parts of the world and to make a comparison between Romania and different countries or markets.

REFERENCES:

- Bradley, F. *Marketing international*. București: Editura Teora, (2001)
- Booms, B.H. and Bitner, B.J. "Marketing strategies and organisation structures for service firms." In *Marketing of services*, edited by J. Donnelly and W. R. George, 47-51. Chicago: American Marketing Association, (1980)
- Brouthers, K.D. and Brouthers, L.E. "Why Service and Manufacturing Entry Mode Choices Differ: The Influence of Transaction Cost Factors, Risk and Trust." *Journal of Management Studies*, 40 (2003): 1179-1204
- Chen, J.J. and Dimou, I. "Expansion strategy of international hotel firms." *Journal of Business Research*, 58 (2005): 1730- 1740
- Chen, L.Y. "TCE Mode Selection Criteria and Performance." *Journal of American Academy of Business*, 11 (2007): 244-252
- Contractor, F.J. and Kundu, S.K. "Modal Choice in a World of Alliances: Analyzing Organizational Forms in the International Hotel Sector." *Journal of International Business Studies*, 29 (1998): 325-358
- Cosma, S., Fleșeriu, C. and Bota, M. "Hotel chain's strategic options to penetrate the Romanian market.", *Amfiteatrul economic*, XVI (2014): 1352 - 1365
- Cristureanu, C. *Strategii si tranzactii in turismul international*. București: C.H. Beck, (2006)
- Erramilli, M.K., Agarwal, S. and Dev, C.S. "Choice between non-equity entry modes: An organizational capability perspective." *Journal of International Business Studies*, 33 (2002): 223-242
- Guillet, B.D., Zhang, H.Q. and Gao, B.W. "Interpreting the mind of multinational hotel investors: Future trends and implications in China." *International Journal of Hospitality Management*, 30 (2011): 222-232
- Gilligan, C. and Wilson, R.M.S. *Strategic Marketing Management: Planning, Implementation and Control*. Oxford: Elsevier Butterworth-Heinemann, (2005)
- Johansson, J.K. *Global Marketing, Foreign Entry, Local Marketing & Global Marketing*. Boston: McGraw-Hill/Irwin series in marketing, (2006)
- Schilke, O. Reimann, M. and Thomas, J.S. "When Does International Marketing Standardization Matter to Firm Performance?" *Journal of International Marketing*, 17 (2009): 24-46
- Jones, P. Hillier, D. and Comfort, D. "Sustainability in the global hotel industry." *International Journal of Contemporary Hospitality Management*, 26 (2014): 5-17
- Yu, Y. Byun, W. and Lee, T. J. "Critical issues of globalisation in the international hotel industry." *Current Issues in Tourism*, 17 (2014): 114-118
- Călărețu, V.B. "Development strategies for hotel chains." *Proceedings of the International Conference on Business Excellence*, 1 (2011): 95-98
- Cline, R. S. Hospitality adjusts to globalization, 2002. Accessed November 29, 2015, <http://www.hotel-online.com/Trends/Andersen/global.html>
- Aliouche, E. H. and Schlentrich, U. A. "Towards a strategic model of global franchise expansion." *Journal of Retailing*, 87 (2011): 345-365
- Wilson, A., Zeithaml, V. A., Bitner, M. J. and Gremler, D.D. *Service Marketing: Integrating Customer Focus Across the Firm*. London: McGraw-Hill Education, (2012)

Lee, T. J. "Role of hotel design in enhancing destination branding." *Annals of Tourism Research*, 38 (2011): 708-711

Sutthijakra, S. "Managing service subsidiaries through an innovation perspective: a case of standard interpretation in multinational hotels", *Service Industries Journal*, 31 (2011): 545-558

THE EFFECTIVENESS OF INNOVATION PROJECTS IN POLISH INDUSTRY

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ABSTRACT

The objective of the study was to determine the dependency of the net income from the sales of new and significantly modernised products on the expenditure on (1) marketing and staff training as well as on the expenditure on (2) land, buildings and structures; machinery, technical equipment and tools; and means of transportation within the scope of product and process innovations in Polish industry in 2010. Furthermore the study was intended to determine the effectiveness of the abovementioned expenditure aggregated to descriptive variables (1 and 2). In the study, the correlation and regression methods as well as the least squares method was applied. The estimation resulted in the determination of functional dependency of net sales income on the expenditure on marketing and staff training (0.5040) as well as on the expenditure on land, buildings and structures; machinery, technical equipment and tools; and means of transportation (0.8064) in the field of innovative processes in industry. The net sales income increased more than proportionally relative to the combined effect of the aforementioned expenditure (1.3104). The total increase in the aforementioned expenditure by 10% resulted in the increase in net sales income by 13.1%. The determined power regression model may have practical implications for the economic evaluation of expenditure in innovative processes in Polish industry in the future, as well as for the forecast (prediction). The expenditure application in innovative processes may also have social implications connected to the increase in the value-in-use of products and with the increase in the social efficiency of work in Polish industry.

Key words:

innovation process, correlation and regression, effectiveness

1. INTRODUCTION

Innovation in a broader aspect comes down to a model conception where innovations are the function of knowledge, skills, entrepreneurship and creativity. This model illustrates the determinants of innovative developments in economic systems.

Currently, attempts are being made to create a general theory of innovation¹ which would cover the entire innovative process in its material, functional and interdisciplinary meaning.² Such a theory would also constitute a theoretical directive for the needs of identification, measurement and economic assessment of innovations.³

Therefore various partial theories describe a system for measuring innovations in products and processes, techniques and technology, marketing activities and training applications which occur within the system. Innovations within the scope of products help to increase sales and the related margins while innovations which improve processes result in an increase in work efficiency and build cost advantage over competitors.⁴

The author hopes that the empirical studies in the scope of product and process innovations, using the Cobb-Douglas model, as presented below, will contribute to the creation of the general theory of innovation (model = theory). In the future, the author will conduct studies using other classifications of innovative expenditure streams.

The objective of this study was to determine the dependency of the net income from sales on the expenditure on marketing and staff training as well as on the expenditure on land, buildings and structures; machinery, technical equipment and tools; and means of transportation within the scope of product and process innovations in Polish industry in 2010. Furthermore the study was intended to determine the effectiveness of the abovementioned expenditure aggregated to descriptive variables.

The underlying hypothesis in the study assumes that the mean and marginal productivity of expenditure on marketing and staff training, and of the expenditure on land, buildings and structures; machinery, technical equipment and tools; and means of transportation remained in the rational economic zone in Polish industry in 2010. If such dependence occurs, it will indicate an adequate level of proportions among these innovative expenditures.

1 A complex set of innovation measures causes enterprises to adapt better to the conditions of the global external environment, says Pachura (2012).

2 Further, commerce liberalisation indicates significance of other factors for the increase made like other policy, investments and institutions, as indicated by Winters (2004).

3 The role of innovations as a growth driver in market economy has been emphasized by Janasz et al. (1993).

4 A strong potential of Poland as defined by Pechon (2007) necessitates development of scientific research and new technologies.

2. MATERIAL AND METHODS

The source of empirical data was the Statistical Yearbook of the Voivodeships, the Central Statistical Office [GUS] in Warsaw, 2011. It enabled the identification of data determining the process of innovations in industry, i.e. both expenditure and effects (objectives) constituting the elements of an economic account. In addition, expenditure (costs) and effects have an impact on each other; for this reason they were quantified as to their value and included in the account of innovation effectiveness on the scale of mesoeconomics and of the whole country. The variables which define the development of market transactions and net sales income were grouped according to production factors and innovation initiatives.

Variables aggregated to the multiple curvilinear function model were selected by applying logarithm correlation coefficients. Numerical calculations were performed with Statistica 9.0 software.

3. RESULTS OF THE STUDY

The statistical characteristics of the features of the adopted recognition of aggregated variables were determined by use of the arithmetic mean, range and coefficient of variation; they are presented in Table 1.

Table 1.: Statistical Characteristics of Variable Features Relating to Product and Process Innovations in The Polish Industry in 2010 (Current Prices)

No.	Specification*	Symbol	Unit of Measurement	Arithmetic Mean	Range min. - max.	Coefficient of Variation (%)
1.	Net income from the sales of new and modernised products	Y	million PLN	6443.64	609.03-24965.20	122.05
2.	Expenditure on marketing of new and modernised products and on staff training regarding innovative activity	x1	million PLN	32.32	1.70-151.40	125.38

No.	Specification*	Symbol	Unit of Measurement	Arithmetic Mean	Range min. - max.	Coefficient of Variation (%)
3.	Expenditure on buildings and structures; machinery, land, technical equipment and tools and means of transportation	x2	million PLN	1009.48	177.70-4344.80	114.11
4.	Expenditure on acquisition of technology	x3	million PLN	94.16	3.20-705.00	193.02

Source: Statistical Yearbook of Voivodeships, Central Statistical Office (GUS) in Warsaw, 2011. Author's calculations.

*Data relate to economic entities where the number of employed persons exceeded 49. Data were processed on a voivodeship level.

The mean value of the net income from sales (Table 1.) of new and significantly improved products in industry, in a typical voivodeship, was 6443.64 million PLN, and the range of net income indicates a large variation between voivodeships. This also confirms the internal variability within net income from innovative processes in 2010. It was close to the internal variability of expenditure on the marketing of new and improved products and staff training in innovative activity in industry. The effects of innovative processes are characterised by their uneven distribution over time.⁵

The expenditure on marketing of new and improved products and staff training was designed to maximise net income while keeping costs at a minimum and providing the highest customer satisfaction. New and significantly improved products were also associated with the implementation of more sophisticated marketing methods; this has been described by normative theories of marketing. Their mean level in a voivodeship was the lowest within the analysed expenditure data. The extreme values of expenditure on marketing and staff training were also the lowest ones while their distribution in industry and voivodeship was similar to those obtained from net income transactions.

Expenditure on land, buildings and structures; machinery, technical equipment and tools and means of transportation were primarily process innovations connected with the improvement in production and distribution methods within the scope of products and services in industry. In addition to land expenditure, these were the typical technical (material and functional) innovations. Among the variables shaping the variability of net income in industry in an average voivodeship, these were

⁵ This results in the situation where research and development are expensive and do not always bring the expected results, explain Tomke and von Hippel (2002).

characterised with the highest level and range. Their internal variability, however, was the lowest.

The technological novelty of a given solution, including the expenditure on technology acquisition, should be examined in the context of its results (benefits) if it is to participate in the process of technological innovation.⁶ It is difficult, therefore, to quantify the benefits of the purchased ready-made technology in the form of documentation and rights. It was related to both the accuracy and reliability of the measurement. Although their level in industry and voivodeship was the lowest of the examined expenditures, their range was expanded and their internal differentiation was the highest. For this reason, the purchased ready-made technologies of documentation and rights may have exerted a positive or negative impact which determines the positive or negative development of innovation. As the regression coefficient determined for them was at a significance level exceeding 0.05, they were brought to the constant of the equation (a).

The literature sources mention the opinion that the market incentives for innovation applications are too weak.⁷ Thus, the assessment of the innovation effectiveness was of importance – the assessment of the extent to which they contributed to the increase of effectiveness of the net sales income in industry in Poland in 2010.

A random examination of the random component distribution was performed by a graphical analysis which confirmed the verification of the hypothesis, assuming the validity of the choice of analytical form of the function model (Table 2). The Shapiro-Wilk test was applied to the examination of the random component normality. The values resulting from calculations, when compared with critical values at a significance level of 0.05 did not justify the rejection of the hypothesis that the distribution of the random component was normal. Autocorrelation was examined using the Durbin-Watson test; based on its results, the lack of autocorrelation of the random component was determined at the significance level of 0.05. The hypothesis of the random component homoscedasticity was verified by the Goldfeld-Quandt test. At the adopted level of significance of 0.05, the read critical value of Snedecor's F-distribution exceeded the calculated value; as a result, there was no basis for the rejection of the hypothesis of the random component homoscedasticity.⁸

6 Assigning the top priority to expenditure on research and development from the state budget and enterprises is a key issue in the Polish economic policy, emphasizes Dworak (2010).

7 As explained by Frost (2004), this also contributes to the situation where over long term concepts co-exist and concentrate investment projects with security short-term.

8 Examples of application of significance tests for assessment of multiple regression model parameters have been presented by Aczel (1989 and 1993).

Table 2.: Exponential Regression Of Net Income From The Sale Of New And Significantly Improved Products (Y) From The Expenditure On Marketing And Staff Training (X₁) And Investment In Land, Buildings And Structures, Machinery, Technical Equipment And Tools And Means Of Transportation (X₂) Within The Field Of Product And Process Innovations In The Polish Industry In 2010

a*	Regression Coefficients		Standard error		t Test		Level of Significance		R ₂
	X ₁	X ₂	X ₁	X ₂	X ₁	X ₂	X ₁	X ₂	
3.8432	0.5040	0.8064	0.24	0.37	2.02	2.17	0.05	0.05	0.83

Source: The Statistical Yearbook of Voivodeships, The Central Statistical Office (GUS) in Warsaw, 2011. Numerical calculations.

*a - constant of equation (de logarithmized); it also includes the mean increase in the value of expenditure on the acquisition of ready-made technology in the form of documentation and rights (brought to the constant of the equation), the regression coefficient of which was determined at a significance level exceeding 0.05 (5%).

The tabular convention comprises the equation of power regression together with its statistical assessment (Table 2.). The data of Table 2. present the functional dependency of the net income from the sale of new and improved products (Y) on the expenditure on the marketing of new and improved products and staff training regarding innovative activity (x₁) and on the expenditure on land, buildings and structures; machinery, technical equipment and tools, and means of transportation (x₂). The aforementioned aggregated variables (x₁ and x₂) explained to 83% the variability of the net income from sale of new and improved products in industry. This was a high explanation. The strength of association, described with the correlation coefficient (R), between net sales income and expenditure on marketing and staff training and expenditure on land, buildings and structures; machinery, technical equipment and tools, and means of transportation amounted to 91% (=R). The standard errors of the function's parameters (regression coefficients) were below 50% of their absolute values. The t test values, in turn, were several times higher than the values of the regression coefficients (parameters), and the significance level of regression coefficients amounted to 0.05. The aforementioned statistical assessments of the regression coefficients (parameters) indicate the possibility of applying them to the econometric assessment of the variability of the net income from the sale of new and improved products in industry in 2010.

Regression coefficients, the function parameters⁹ at x₁ and x₂ determine the flexibility (flexibility coefficients) of the net sales income in respect of the expenditure on marketing and staff training and of the expenditure on land, buildings and structures; machinery, technical equipment and tools; means of transportation within the scope of innovations in industry. Therefore, the regression coefficients (function

9 The Cobb-Douglas production function allows for identification of the role of production factors, explain Zimkova and Barochovsky (2007).

parameters) are, in other words, the flexibility coefficients.¹⁰ In the power function, the exponents of explanatory variables are interpreted as the flexibilities of the endogenous variable in relation to appropriate factors. A flexibility coefficient determines the mean percentage change (increase or decrease) in a dependent variable when the x_j factor increases by 1%, assuming that the remaining factors are constant.¹¹

The flexibility of the net sales income (Table 2.) was higher than the expenditure on land, buildings and structures; machinery, technical equipment and tools and means of transportation within the scope of innovations (0.8064) than for the expenditure on marketing and staff training (0.5040). The association between the regression coefficients (flexibility coefficients) shows that the net sales income in relation to the expenditure on marketing and staff training was 1.6 times less than in relation to the investment in land, buildings and structures; machinery, technical equipment and tools, and means of transportation. Based on the sum of flexibility coefficients (powers) which is higher than unity (1.3104) the net income from the sale of new and improved products in relation to the combined impact of expenditure on marketing and staff training, land, buildings and structures; machinery, technical equipment and tools, and means of transportation increased more than proportionally. The aggregate increase in expenditure on marketing and staff training; land, buildings and structures; machinery, technical equipment and tools, and means of transportation by 10% resulted in an increase of net income from the sale of new and improved products amounting to 13.1%. Based on the impact proportion (sum of flexibilities = 100%), it can be calculated that the impact of expenditure on marketing and staff training amounted to 38.46% and of the expenditure on land, buildings and structures; machinery, technical equipment and tools; and means of transportation - to 61.54%.

The theory of technical development assumes, *inter alia*, the need to perform the econometric assessment of objectives (net income from sale) and causes (costs). Despite the fact that the elements of account, referred to above, belong to the same model, the participation of the examined factors in the growth in net income from the sale of new and significantly improved products was not identical. The important active elements interacting in the creation of the level of net sales income included the expenditure on marketing and staff training from the innovative activity in industry. For this reason it was necessary to determine, within the range of expenditure on marketing and staff training, respective values of the net income from sale. They were then used to determine the average and marginal productivity in industry, presented in Table 3.

10 As explained by Solow (1956), they are Y flexibilities towards x_1 and x_2 , and according to the J. B. Clark's marginal productivity theory, they are shares of outlays of those factors (x_1 and x_2) for product (net sales income).

11 As stated by Aczel (1989 and 1993) it has to be remembered that it is a regression relation and not cause relation (Y depending on x_1 and x_2). Causality is difficult to define and even more difficult to prove.

Table 3.: Mean and Marginal Productivity of Expenditure on Marketing and Staff Training in Innovative Activity in Polish Industry in 2010

Expenditure on marketing and staff training, million PLN (x_1)	Productivity	
	mean, PLN/ PLN	marginal, PLN/ PLN
20.41	227.77	114.79
39.13	164.95	83.13
57.84	135.88	68.48
76.55	118.24	59.59
95.26	106.08	53.47
113.98	97.06	48.92
132.69	90.01	45.36
151.40	84.31	42.49

Source: Author's calculations based on data presented in Tables 1. and 2.

The mean and marginal productivity (Tables 3. and 4.) in relation to each other was proportional through the flexibility constant of the net sales income related to the expenditure on marketing and staff training and to the expenditure on land; machinery, technical equipment and tools; and means of transportation in industry (Tables 3. and 4.).

The mean productivity (Table 3.) was two times higher as compared with the marginal productivity of expenditure on marketing and staff training. The decrease in mean and marginal productivity with the increase in expenditure on marketing and staff training took place in the ratio of 2 : 1. In turn, the increase in expenditure on marketing and staff training within the scope of innovations exceeding 57.83 million PLN was related to an increasingly smaller decrease in their mean and marginal productivity. It explains the fact that as the expenditure on marketing and staff training grew their and marginal productivity remained in the same relationship and demonstrated increasingly smaller drops; indicating an effective allocation.

Marginal productivity decreased at a slower rate (Table 3.); it also affected the decrease in mean productivity, also at a slower rate, while the net income from the sale of new and modernised products grew but its growth rate approached zero. All this took place in the rational economy zone. The decrease in the mean and marginal productivity of expenditure was connected with the economic effectiveness of the increase in equipping the industrial enterprises with fixed and current assets.

The character of the expenditure on land, buildings and structures; machinery, technical equipment and tools; and means of transportation in the innovation process varied from that of expenditure on marketing and staff training within the scope of innovations. New Constructions of buildings and structures; machinery, technical equipment and tools; and means of transportation presented the typical technical, therefore material innovations. This process came to an end with the implementa-

tion of a new innovation.¹² The complexity of the innovation process, and the period when the innovation is considered a novelty, hinder the unambiguity of the economical assessment of technical innovation. EU recognises an innovation (implementation) as a new if it functions on the market up to 3 years.

Mean and marginal productivity (Table 4.) of land, buildings and structures; machinery, technical equipment and tools; and means of transportation showed relative stability since the mid-range of the value of this expenditure and the difference between the two categories did not exceed 1 PLN/ PLN. This difference constituted ca 20% of their mean productivity. The closeness of mean productivity to marginal productivity and the like character of their decrease indicate the relative stability of allocation of the expenditure being the carriers of technical innovation in industry.

Table 4.: Mean and Marginal Productivity of Expenditure on Land, Buildings and Structures; Machinery, Technical Equipment and Tools, and Means of Transportation in Polish Industry in 2010

Expenditure on land; buildings and structures; machinery, technical equipment and tools; and means of transportation, in million PLN (x_2)	Productivity	
	mean, PLN/ PLN	marginal, PLN/ PLN
698.59	6.23	5.03
1218.59	5.60	4.51
1738.59	5.23	4.21
2258.59	4.97	4.01
2778.59	4.77	3.85
3298.59	4.62	3.72
3818.59	4.49	3.62
4338.59	4.38	3.53

Source: Author's calculations based on data presented in Tables 1. and 2.

The productivity decreased causing a drop in average productivity of technical innovation carriers (x_2), albeit at a slower rate, whereas the net income from the sale of new and modernised products grew, but the growth rate approached zero. Just like in the case of the expenditure referred to above, the productivity of capital investment in land, buildings and structures; machinery, technical equipment and tools; and means of transportation remained in the rational economy zone.

The study conducted in 2007 shows that the flexibility of sold production was 1.4 times lower than the flexibility of net sales income (2010) in relation to techni-

¹² The influence of politics on effectiveness and mobilization of resources when investing in fixed assets has been confirmed by Bassanini and Scarpetta (2001).

cal innovation expenditure, while the mean and marginal productivity was: over 3 times and over 2 times [lower] in 2007.¹³ Despite the fact that in 2010 the flexibility of net sales income in relation to technical innovation expenditure was higher, the narrowed range of expenditure demonstrated lower mean and marginal productivity of this expenditure in 2010. This was connected with the gradual decrease in innovation expenditure in industry occurring between the compared years.

An examination of the growth rate of expenditure on innovations in machinery, technical equipment and tools and means of transportation shows that in Lubelskie Voivodeship in 2007 it amounted to 50%, while in respect of buildings, structures and land - 10.53%. This indicates a differentiation of innovation expenditure applications in industry in the Polish voivodeships¹⁴; the above is confirmed by data presented in Table 1.

The profitability of innovative products and processes has to take into account the requirements of universality (including the cost-efficiency of the expenditure resulting from the principle of rational economy), the correlation between subjects and time and of the assessment of purchase and sale (transaction) results. The cost-intensity of the net sales income within the range of expenditure on marketing and staff training is presented in Table 5.

Table 5.: Cost-Intensity of the Net Sales Income in Relation to the Expenditure on Marketing and Staff Training in Polish Industry in 2010

Net sales income, in million PLN	Cost-intensity of the net sales income PLN/ PLN
4649.273	0.0044
6453.486	0.0061
7858.705	0.0074
9051.192	0.0085
10105.880	0.0094
11061.890	0.0103
11942.730	0.0111
12763.820	0.0119

Source: data presented in Table 3. and calculations based on Table 2.

The data presented in Table 5. goes on the assumption that creative marketing and staff training have very little impact on 1 PLN of the value of net sales income even when it grew within the range of this expenditure. This explains the fact that innovative products are not involved in the expenditure in industry referred to above. It may

¹³ Results of econometric research into the intensity of innovations in the output sold by Polish industry in 2007 have been presented by Zwolak (2010).

¹⁴ Example: the research into changes in research and development activity (R&D) and innovation activity in the Lubelskie Voivodeship in Poland that has been conducted by Zwolak and Tarkowski (2013).

have been related to the higher worth of these products. Also, the cost-intensity of the net sales income within the range of expenditure on land; buildings and structures; machinery, technical equipment and tools; and means of transportation (Table 6.) demonstrated relative stability when net sales income grew.

Table 6.: Cost-Intensity of the Net Sales Income According to Expenditure on Land, Buildings and Structures; Machinery, Technical Equipment and Tools, and Means of Transportation in The Polish Industry in 2010

Net sales income in million PLN	Cost-intensity of the net sales income PLN/ PLN
4355.582	0.1604
6821.838	0.1786
9085.756	0.1914
11220.200	0.2013
13260.690	0.2095
15228.120	0.2166
17136.140	0.2228
18994.340	0.2284

Source: data presented in Table 4. and calculations based on Table 2.

At the maximum level of net sales income, the impact of the aforementioned technical innovation expenditure on 1 PLN of net sales income in industry amounted to ca 23%;¹⁵ which is not a significant amount if we assume that from the functional point of view, a whole machine or means of transportation takes part in the innovation process during the transformation of investment into new products and implementing new production method.

4. SUMMARY AND CONCLUSIONS

The conducted studies enable the presentation of the following conclusions:

Expenditure on marketing and staff training, land, buildings and structures; machinery, technical equipment and tools, and means of transportation accounted for 83% of the variability of net income from the sale of new and modernised products in industry (R^2). This was a high explanation. At the same time, the strength of association described with the correlation coefficient between the net sales income and expenditure on marketing and staff training and investment in land, buildings and structures; machinery, technical equipment and tools; and means of transportation amounted to 91% ($= R$).

Net income from the sale of new and modernised products as related to the combined effect of the expenditure on marketing and staff training and of expendi-

¹⁵ The technical dependencies and their data limit the options of productivity measurement for the sector, declares Nin et al. (2003).

ture on land, buildings and structures; machinery, technical equipment and tools; and means of transportation grew more than proportionally (1.3104). The total increase in the aforementioned expenditure by 10% resulted in an increase in the net income from the sale of new and modernised products by 13%.

As the expenditures on marketing and staff training grew, their mean and marginal productivity maintained the same relationship and demonstrated an increasingly smaller decrease which indicates their effective allocation. At the same time, the investment in land, buildings and structures; machinery, technical equipment and tools; and means of transportation showed relative stabilisation starting from the half of values within the range of this expenditure and the difference between the examined categories did not exceed 1 PLN/ PLN (20%). The identical character of decreases and the approximate values of mean and marginal productivity indicate the effective allocation of expenditure of a typical innovation character that the aforementioned expenditures have. Differences in the productivity of these investments result from their intensity (level), but also from the material structure of this expenditure in innovative processes. The mean and marginal productivity of the innovation expenditure referred to above remained in the rational economy zone.

The cost-intensity (cost-effectiveness of expenditure or effectiveness of the net sales income) of new and modernised products in industry was higher in relation to the expenditure on land, buildings and structures; machinery, technical equipment and tools; and means of transportation. This effectiveness depended on the relationship of the analysed expenditure (combinations), as well as on the performance (cost effectiveness) of the production factors they represented and the function they fulfilled in the process of innovation.. Technical innovations meant the technical knowledge used for the first time in a new combination, therefore having a specified relationship with other expenditure. In turn, the cost-intensity of net sales income as related to the expenditure on marketing and staff training was very low (minimal) due to the distinct character of the interactions related to the product-market relationship (transaction) which was associated with the differing profitability of these expenditures.

In the course of the conducted studies relating to the character of the study subject, the hypothesis that the mean and marginal productivity of expenditure on marketing and staff training and of the expenditure on land, buildings and structures; machinery, technical equipment and tools; and means of transportation remained in the zone of rational economy of innovative expenditures in Polish industry in 2010 was confirmed.

REFERENCES:

- Aczel, A. D., *"Complete Business Statistics"*, Second Edition, Irwin, Burr Ridge, Illinois, (1989 and 1993) 5-997
- Bassanini, A. and Scarpetta, S., *"The driving forces of economic growth: panel data evidence for the OECD countries"*, OECD Economic Studies. II, 33, (2001): 9
- Dworak, E., *"Evolution of the Polish Innovation Policy"*, Comparative Economic Research. 12(4), (2010): 121-132
- Frost, F. M., *"Value orientations: impact and implications in the extension of complex farming systems"*, Australian Journal of Experimental Agriculture. 40(4), (2004), 511-517
- Janasz, W., Gołębiowski, M., Grabiec, W., Łukasik, W. and Niewiński, A., *"Innowacje jako czynnik rozwoju przedsiębiorstwa w gospodarce rynkowej"*, Wydawnictwo Naukowe Uniwersytetu Szczecińskiego. Szczecin, (1993)
- Nin, A., Amdt, C., Hertel, T. W. and Preckel, P. V., *"Bridging the Gap between Partial and Total Factor Productivity Measures Using Directional Distance Functions"*. American Journal of Agricultural. 85(4), (2003): 928
- Pachura, A., *"Innovation theory: an epistemological aspects"*. Polish Journal of Management Studies. 5, (2012): 133
- Pechon, D., *"Innowacje w Polsce"*, Luxemburger Wort. 11. 08 (2007)
- Solow, R., *"A Contribution to the Theory of Economic Growth"*, Quarterly Journal of Economics. 70(1), (1956): 65-94
- Tomke, S. and von Hippel, E., *"Customers as Innovators. A New Way to Create Value"*, Harvard Business Review. April (2002): 74-81
- Winters, L. A., *"Trade Liberalisation and Economic Performance: An Overview"*, Economic Journal. 114, 493, (2004): F4
- Zimkova, E. and Barochovsky, J., *"Estimation of potential product and output gap in slovak conditions"*, Politická ekonomie. 4, (2007): 473-484
- Zwolak, J., *"Intensywność innowacji produkcji sprzedanej w przemyśle Polski"*, Zeszyt Naukowy Wyższej Szkoły Humanistyczno-Ekonomicznej im. Jana Zamoyskiego z siedzibą w Zamościu. Zamość, (2010): 98-105
- Zwolak, J. and Tarkowski, K., *"Zmiany w działalności badawczej i rozwojowej oraz innowacyjnej w województwie lubelskim"*, Zeszyty Naukowe WSEI seria Ekonomia. Lublin. 6(1), (2013): 223-244

CAUSAL PEER EFFECTS IN FINANCIAL DECISION MAKING

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ABSTRACT

The research paper connects three key elements from the study (conducted using neural database of experimental asset market that have tested the fundamental mechanisms that generate peer effect, the neural database was measured using functional magnetic resonance imaging (fMRI); Cary Frydman, 2015- University of Southern California-Marshall School of Business) relating to: experimental control in the laboratory of random peer assignment,; neural activity in testing new prediction explaining peer effect and neural activity in the conduct of trade. The methodology used in the research of peer effect relies on the theory of predicting error, the signal which measures changes in anticipation of the net present value which generates new information. Cognitive neuroscience shows that the prediction error is measured in a certain part of the brain known as the ventral striatum. Measuring the potential value gives insights to economists on which factors affecting the subjective utility.

Testing is constructed with 48 patients who were given \$ 100 of experimental money and they were given the opportunity to invest in two separate assets in over two hundred experiments. The experiment showed that subjects converted their final portfolio from experimental currency to real dollars using the exchange rate of 5: 1. In addition to profits from the experiment, subjects were paid a fixed "show-up" fee of \$ 20.

There are two difficulties in identifying causal peer effect in economic behavior (Minsk, 1993). Correlated behavior between two representatives may potentially be the engine by common shocks of the peer group or endogenous election in the peer group.

In addition to the prediction that deals with causal peer effect, there have been further developed predictions that generate different mechanisms of peer effects using neural database.

Focus on neural prediction is the neural activity that generates the moment when peers allocation investment is published, respectively the display of "peer decisions". This display is exclusively linked to the processing of information as opposed to considering solutions. This is significant because neuroscience is characterized by neural activity that generates new information in decision making.

Thus, neural prediction is determined by the ventral striatum, which predicts the occurrence of peer decisions. The large part of the literature in social psychology suggests that people have a direct need to follow others, especially manifested in situations where there is no objectively correct action, so the cause of intermediaries used peer action as a social anchor on which it bases its behavior.

Certain dialectical relationship between neuroscience and neurofinance determines a deeper understanding of financial decision making which leads to different results and different cognitive operations. Our thoughts, although abstract in form, determine procedures of certain neural circuits within our brain. The goal of neuroscience is uncovering these circuits and the possibility of deconstructing complex thought processes in individual components and determine how they integrate into our thought process. The results lead towards the understanding of decision making which shape our future and fate. The market implications, from the aspect of neurofinances, is vital in uncovering deeper knowledge about the effect of

emotions and states such as attitudes towards risk, excessive trust, heuristic bias and gender, which finally results in financial decision making on an individual and institutional basis. The implications of fear and corruption in the financial industry can be explained through neurofinance and even give us more choices in the decision process. Social decisions demand an evaluation of costs and benefits for oneself and others. Connected with emotions and caution, the amygdala is involved in decision making and social interactions. The harm caused by the amygdala deteriorates social interaction, while the social neuropeptide oxytocin affects social decisions by changing the function of the amygdala in one aspect.

Empirical research, conducted on a sample of randomly selected subjects who were given identical information, shows that on the basis of the neural database gathered from experimental asset market for testing underlying mechanisms which generate peer effect (Cary Frydman, 2015). Experimental evidence of peer effect in individual behavior of trade and neural data were used for testing of experimental mechanisms generating peer effect. Although the mechanisms which create peer effect in laboratory experiments don't suit the quantitative norm they can ensure settings for probing mechanisms using neural database. The methodology of neurofinance replicates the behavior of trade in laboratory conditions which are robustly found in the field.

Keywords:

Neuroscience/ neurofinance/ mechanisms that generate peer effect

1. INTRODUCTION

The connection in neuroscientific research on the topic of financial decision making is defined by its type; this is why we can define decision making as a logical analysis in situations of undetermined outcome or in the form of a cost benefit analysis. In situations of certainty the probability of the majority of individuals creating a clear defined choice and is relatively high; however, when financial decision making involves a cost benefit analysis with uncertainty, the variability increases as well as uncharacteristic results. The type of process of decision making can lead to different results and different cognitive operations.

Research conducted on the field of neurofinance on the topic of decision making is focused mostly on two sections of the brain which influence decision making that is the nucleus accumbens and septal insula, both parts of subcortical structure of the brain. Specifically, the American scientists Camelia Kuhnen and Brian Knutson (2005) scanned the brains of the participants using functional magnetic resonance imagery (fMRI), while they were making financial decisions. Our social decisions need to evaluate the costs and benefits for ourselves and others. Connected with emotions and caution, the amygdala is involved in decision making and social behavior. Signals from the amygdala for rewards and punishments are identical to facial expressions and observing others. The damage caused by the amygdala ruins social interactions and the neuropeptide of oxytocin influences social decisions and partially changes the functions of the amygdala.

The primary mechanisms of trade models on the financial market don't allow investors social interactions with others, they boil down to beliefs and decisions through market prices (Hirshleifer and Teoh, 2009). Research conducted in the past 15 years has shown that social interactions significantly influence financial decisions in different situations. Peers can influence the participation in the stock market (Hong et al., 2004; Brown et al., 2008; retirement savings decisions, Duflo and Saez, 2003; managing the selection of shares of common stock, Hong et al, 2005; and individual investors make decisions about trading, Ivkovic and Weisbenner, 2007; Bursztyn et al., 2014).

Research conducted on the topic of understanding the mechanisms of peer effect in investment decisions (Cary Frydman, 2015) points towards a causal relation. However, there are two channels through which peer effect can influence decision making. Firstly, the agent can learn the basic values of assets from the peer's decision and therefore the information channel, and second the resulting decisions of a peer can directly enter a functional benefit to another intermediary, therefore a preferential channel. Yet there is one typical mechanism behind the information channel, updating beliefs through Bayes rules - there are variations in a series of competitive mechanisms within the class of preferences that are fundamental to explaining peer effect. This can be explained by example; the investor may affect its peer as it is concerned about social status, or because there is an aversion to inequality.

The neural activity measured using functional magnetic resonance imaging (fMRI), is used directly to measure interest in relative wealth in the dynamic environment of investment. Although a review of data can be effective in the measurement of subjective wealth (Luttmer, 2005, Card et al., 2012), neural data can directly measure the moment when the relative change in wealth, devoid of potential bias, guides self-reference. Neural information in experimental measurements gives rise to new tests of functional forms of utility over relative wealth. This significance is reflected in the prediction model of asset prices where the investor has a preference for the status that critically depends on the curvature of utility investors face over the relative wealth (Ruslanov, 2010). Neural database allows the launch of basic tests of concave and convex functions by taking advantage of time-series variation in the relative changes in wealth, during the experiment with functional magnetic resonance imaging (fMRI). Measuring neural activity was based on data collected throughout the brain through fMRI of blood, which is the amount of oxygen in the brain.

Analysis of trading in an environment using neural database circumvent obstacles in identifying the causes of peer effect. The data was collected in a controlled laboratory environment where the participants were randomly divided into peer groups. This attractiveness enables the researcher to sidestep the problem of identifying where the correlation between two intermediaries' behaviors may be chosen by selecting similar peer groups or common shocks within a peer group (Manske, 1993). This enables the experimenter to control common shocks in peer groups.

The link between the complexity of peer effect is linked to economic literature on relative relationship of wealth and preferences for status based on Dusenberry, 1994, in the field of experimental economics of social settings such as concern about status or aversion to inequality (Falk et al., 2008; Heefetz and Fank, 2010). Other studies rely on subjective richness that is negatively associated with income of peers. (Luttmer, 2005; Card et al., 2012). In literature on asset prices it explains the empirical rules in the aggregate behavior of the stock market and portfolio choices (Abel, 1990; Campbell and Cochrane, 1990; DelMarzo, 2008; Roussanov, 2010). From the point of neurofinances which links neuroscientific research on the contributions of the decision-making process (Lo and Repin, 2002, Kuhnen and Knutson, 2005; Preuschoff et al., 2006); from the aspect of cognitive neuroscience that investigates the neural mechanisms of social preferences (Camerer and Fehr, 2007).

2. SCIENTIFIC THEORETICAL BASIS ON THE DEVELOPMENT OF NEUROFINANCE

Our own limits can be known only when we fearlessly enter the area of the unknown. Only relentless analysis of theories, even those that lead us to strange and unfamiliar areas, will give us a chance to get to know the wide expanse of reality.

Neurofinances are a relatively young scientific field which combines knowledge of neuroscience and finance. High costs in neurofinancial research are associated with tools such as fMRI, PET, MRI, SPECT and other non-invasive techniques of brain imaging, which limits research and therefore has relatively little scientific work which connects the topic of neurofinance.

The processes going in our brains when we make decisions are extremely complex. This is the reason for a short summary of scientific studies in making financial decisions. Decision-making can be to involve memory access, system of values and emotional responses. Often we need to accumulate evidence for and against the different choices that are available to us and to evaluate the possible outcomes and risks and suppress learned responses, and all these processes can take place unconsciously. Some parts of the brain have been identified in the decision-making process including the orbitofrontal cortex and anterior cingulate. Orbitofrontal cortex is responsible for processing, evaluating and filtering information from social or emotional nature. The Anterior cingulate is responsible for the control and selection of appropriate behavior and tracking errors and incorrect answers. The dorsolateral prefrontal cortex indirectly participates in decision-making. It is involved in working memory, planning and flexibility.

The brain is not a computer. The structure of the neurons of the brain is connecting, loose, flexible, interwoven and rich. So, in our minds, we have a magnificent structure that governs our actions and in some way causes awareness of the world around us. The brain can better be described as a self-organizing system. Neuroscience includes not only anatomy and psychological research but also neurobiology, computer science and biochemistry. It is important to point out that in neuroscientific research other disciplines are included; psychology, psychiatry, neurology, social neuroscience and now neuroeconomics / neurofinances. The brain and nerves in our body are composed of neural cells that are specialized to transmit signals to each other. Neurons contain cytoplasm (fluid) in which are different molecules as well as a nucleus in which DNA is contained. Each neuron can send signals through the axons and receive signals from other neurons dendrites. Basically each neuron has one axon and many dendrites, thus can receive signals from thousands of other cells but only send one signal at a time. The Axon of each neuron extends to other neurons, but the axon does not touch the cell that receives the signal. Between them there is a synapse, a small tiny space. The brain contains about 10 million neurons and about 1,000 trillion connections. As we use our brain we strengthen dependable connections, building each connection easier. This is how memory develops.

The area of the cerebral cortex that is most closely correlated with the ability of thinking is the Prefrontal cortex- PFC. The Prefrontal lobes are located on the front of the brain, at the top of the cortex. This is the most mysterious and the most intriguing part of all the areas in the brain. This golden vault has various functions; awareness, impulse, free will, inner self, strategic decision making, complex thoughts and emo-

tions, self-control and morals (free will, inner self, morals has physiological terms. Neuro-philosophy studies the connection between free will and neuroscience. Some areas of the human brain involved in mental disorders that may be associated with free will. Some thinkers like Daniel Donett and Alfred Mele emphasize that free will implies many things, among these versions of free will is dualistic and some do not. But different concept of free will are compatible with neuroscientific approach). The Prefrontal cortex seems manages the sequence, structuring and directing behavior, particularly in challenging or new situations. It is believed to mediate in deciding between alternative options, interpretation and modeling of potential future. A healthy prefrontal cortex allows us to resist the attempts of various influences.

The Prefrontal cortex does not communicate directly with the outside world, but it receives information from all parts of the brain. This action is the integration or meeting point as Elkhonon Goldberg neuroscientist said "this is the only part of the brain in which the incoming signals from the body meet with the incoming signals from the outside world." We can conveniently point out that the prefrontal cortex carried out the ideology of the brain, makes important decisions and strikes a balance between opposite impulses and inclinations. Damage to the frontal cortex affects the ability to make good financial decisions.

Neuroscientific research has revealed which parts of the brain respond to rewards and which parts are responsible for motivation. These studies were a sophisticated mix of algorithms and pharmacology. Pictures show that chemicals like dopamine were transferred from neuron to neuron, figuratively speaking as modern robots made calculations. This research has enabled the formation of the scientific field of neuroeconomics / neurofinances.

So the combination of biology, medicine, economics, psychology and engineering allow us to achieve an understanding of the basic processes of the brain and understanding of neurofinances, because financial decisions result in neuro-physiological processes including constant re-evaluation on the one hand and statistical problems on the other hand, balancing the different aspects of emotional and mathematical values. Experimental studies have shown the impact of emotions on decision-making. Neurofinances can be defined as the application of neuroscience in investment activities. Experimental area of neurofinances is defined by the application of scientific methods in identifying carriers and modifier of choice behavior. Experimental tools include neuro-imaging and monitoring equipment that are often the tools of choice in such research. By applying neuroscientific research tools, we have insights in biological carriers of decision makers. Neurofinancial research includes: taking the financial risk (excess and aversion); formation of expectations; valuation; presentation of information and updates to the formulation, reference points, and the emotional charge; probability estimation under conditions of risk, uncertainty and ambiguity; cooperation, competition, the crowd and the social impact of the choice. Neurofinancial research of human behavior under conditions of

risk and rewards identifying correlations with the behavior of a neuron in the brain involved in motivation, emotion, and a reflection-region strategy. Biology can have constructive and detrimental effects on investment decisions.

Andrew Lo, a finance professor at the MIT Sloan School of Management, examined the relationship between biology and financial decisions. His work is one of the most intriguing direction in which neuroscience and biology can move into the business world. Some individuals in the market grow better than others which motivated him to explore the possibility that biological differences undermine the differences in capabilities between winners and losers. His results suggest that differences in the market between individuals form small but very useful opportunities for profit. A key area of the brain is an emotional system and especially one that is ruled by fear.

In cooperation with Russian neuroscientist Dmitry Repin, Andrew Lo has measured over the year 2001 the physiological responses of professional brokers. They gathered a group of brokers who worked on the foreign exchanges and the group who worked in one department of a large financial institution in Boston that specializes in global investments. Measurements were collected during working hours lasting 49-83 minutes. The collected data was compared with the specifics of the changes of the market. On that occasion, they used a computer algorithm to extract such events from the market which are traded in foreign currencies (euro, dollar, yen and British pound). The volatility of the market price includes deviations, unlike bid and ask price, reverse price trends and fluctuations and volatility of prices and yields. The study of these two scientists has made another division of the experienced and inexperienced broker to see how experience affects the autonomic reactions to market events. Although the sample was small there was an astonishing correlation between physiological reactions and market trends. The parameter in the strongest correlation, blood pressure, increased in both groups at a time when the market was extremely unstable. Measurement of impermanence is taken as the difference between the maximum and minimum prices in a short time interval and presented as part of the average cost, and is related to the short-term variance mean. Analysis showed that the blood pressure rose before market instability. This shows us that the broker's body reacted in advance to signs that announce major instability manifested by changing the price. This also shows the ability of the brain to perceive the subtle indicators that are not visible from the analysis of price movements.

Later experiments have shown the possibility of emotional state and success in trading. With this approach, they were checking if a certain kind of personality has greater potential to become a good broker. Using standardized tests found a correlation between personality and success in trading was not found, which led to the conclusion that there is no perfect personality for trading on a stock exchange. However, it found the correlation between mood and success in trading, which is not a surprise. People are happy to earn and unhappy to lose. The most important correlation that

has been discovered is that they are most pronounced in the worst traders. The worst traders allow emotions to obscure their perception and decision-making processes.

Research conducted by John COATES- senior researcher in neuroscience and finance at the University of Cambridge- and his team studied in 2007. the causes of volatility in the stock market. In the sample they took young brokers who dominated the field of trading. Coates and his team took the saliva of 250 mostly young men and found a correlation levels of testosterone which is high in the morning, and their self-confidence which is also high. Good results have indicated that their testosterone levels are increased above expectations. In those moments, the young people felt the intensity and infallibility in their work which has led to risky behavior of trading in buying overpriced stocks. When stocks fall, testosterone levels are back to normal. We can conclude that an enormous amount of testosterone dictates the behavior of traders. Testosterone is a molecule that explains the irrationality, because too much testosterone can lead to disharmony and economic bubbles in the stock market.

Brian Knutson of Stanford University and Camelia Kuhnen, a professor of finance at Northwestern's Kellogg School of Management scanned the brains of investors as they made decisions to buy and sell. Investors with the highest risk, brain scans showed increased activity in the brain nucleus accumbens - part of the brain that lights up, and an increase in dopamine. Studies have also found that increased activity in the second part of the brain when something unpleasant or dangerous happens.

In today's global financial climate, many people are faced with challenges in financial decision-making and their responsibility towards others. Neuroscientists use their research to face this complex problem and neuroeconomics / neurofinance help link biological and social sciences giving an insight into the evolution of decision-making, because it is known that different parts of the brain are activated depending on the possible outcomes of decisions, social cooperation, profit / prize. Chemicals in the brain affect the individual's willingness to believe and also betray when making financial decisions. The brain becomes more active as the size of the expected profit increases, and in humans with the increased risk of financial decisions the insula increases.

Different ways of thinking: perception, reaction to fear, rationality and emotion is based in making complex strategic financial decisions

Between rationality and emotion, there are subtle differences, because rationality implies optimality while emotions are rapid, immediate reactions that are developed through the biological and cultural evolution. Subtle differences between the rational and the emotional could be translated as opposite emotional. This way we get a balance, because each has its place, and it is difficult to predict what will be the right one because it depends on many things. This shows us that we need to be more detailed and precise in thinking about the mechanisms and factors.

Emotions, especially if they are negative, permeate the whole brain. Different parts of emotions concentrate on different aspects of emotion. Orbitofrontal cortex focuses on reward and punishment, the medial prefrontal cortex is engaged in linking the results and procedures, while the amygdala leads to a variety of relationships with different objects and their emotional significance. These are extremely complex networks that connect these and other areas, and we have a different experience: anger, calmness, happiness, unhappiness. Emotions are somewhat devoid of criteria and can cause changes in many interrelated areas of the cortex and sub cortex. Changing emotional states can be long, short, depending on our minds, which can blur the decision making. Emotions, fear and aversion contaminate our thoughts and therefore our action. So if we rely on the emotions that can lead us astray, because we use a shortcut to the action and thus lead to potential decisions in favor of short-term pleasure rather than in favor of greater long term benefits.

Individual differences how the brain processes emotions are very important. People express a wide range of emotions; vary in terms of what their emotional baseline. So we have brave, timid, offensive, peaceful, impulsive people. Some of these differences are caused by genes. Genes affect transmitters such as serotonin, which are thought to influence the degree of anxiety, but there is evidence that early childhood experiences can influence which will be the starting values of many emotions. Research indicates that stress leads people react reflexively and think in stereotypes if they are under stress, unlike if they have time to think about a situation in which they are located.

Our susceptibility to a variety of influences has a strong relationship with our brains, and they work depending on our genes. Studies suggest that the functions of the prefrontal areas are significantly affected by genetics. The low level of education, dogmatism, stress and many other factors affect the function of the prefrontal areas, and it all points to the principles of a dualistic black and white thought process.

By using MRI techniques, it has been shown that dopamine is a key transmitter in the decision making process. Although it is not possible to directly measure the level of dopamine in the human brain, but they can be reached via the genetic fingerprint (author entails number/activity of certain proteins responsible for maintaining the homeostasis of dopamine in the synapse can be labeled possession of certain alleles of certain polymorphic genes encoding these proteins). The human genome is composed of DNA that consists of four pairs of complementary nucleic acid- base pairs.

Christian Buechel, neuroscientist from Hamburg, was measuring using MRI technology the connection between fMRI activity in striatal dopamine system during a gambling game. Buchel created a genotyping of 105 people who participated in the study. He then looked for differences in brain activity which were related to various DAT and COMT genotypes. Dopamine transporter (DAT), the dismantling process is carried out with the help of protein catechol-O-methyl transferase (COMT). As the possibility of winning rose, dopamine activity was stronger. Buchel discovered

that people with the Val / Val combination of COMT and 10R form DAT did not have an increased activity of dopamine as a result of the increased chances of a reward (Catechol-O-methyl transferase (COMT, EC 2.1.1.6) is one of several enzymes that break down catecholamine's such as dopamine, adrenaline and noradrenaline. In humans, the catechol-O-methyl transferase COMT protein is encoded by the gene. As catecholamine's regulation is impaired in a number of medical conditions, several pharmaceutical drugs targeted to changing COMT activity, and thus the availability of catecholamine. COMT was first discovered by biochemist Julius Axelrod in 1957) is one of several enzymes that break down catechol amines such as dopamine, adrenaline and noradrenaline. In humans, the catechol-O-methyl transferase COMT protein is encoded by the gene. As catecholamine's regulation is impaired in a number of medical conditions, several pharmaceutical drugs targeted to changing COMT activity, and thus the availability of catecholamine. COMT was first discovered by biochemist Julius Axelrod in 1957. In simple terms the men were insensitive to risk. These implications are important in the decision making process, especially in decision-making within the group. These genetic variations associated with lower dopamine activity resulting from brain activation levels. If the relative insensitivity to dopamine causes these individuals risky behavior if the potential rewards do not monitor the level of risk, then it is possible that the increased risk starts to choke the brain with dopamine. Such people live of risk and are immune to the effect that fear has on the decision-making processes. The development of science can allow us to cost effectively find out in which of these categories belong we belong to. It can help us in the future in the drafting of the working group that can diversify the genetic portfolio. Our social interaction and our cultural context shape us and our ideas to a greater extent than we are aware.

3. EMOTIONS; TOP OF INTEGRATED DECISION-MAKING

Emotions could be defined as painful or unpleasant feelings that trigger the brain. Neuroscientists have found areas of the brain and brain secretions that are directly associated with emotions including the trading decision makers in given situations (area neurofinance). Decision-making is the core of stock management. It has rational components and emotionality of man.

In addition to technical skills and economic competencies that are important for shareholders and stock traders, the key factor is man. Most stock traders have a very good foundation of knowledge in the economic factors involved in stock trading. Little or no attention is given to the fact that human beings are emotional beings and that emotional intelligence is a factor in most trading, especially when a lot of the time trading is done with a horde mentality.

Basis of Neuroscience / Emotions. Emotions are omnipresent and important for how one sees the world that it becomes necessary to display emotion in a new

way to explain it scientifically. As such every emotional response, from love to hate and fear to joy, and everything in between, can be summed up (though not quite) as a purely physiological reaction to events in the environment that serve as motivation, away from harm to the prize. Although this is a pretty bold statement, it allows us to look objectively and observe emotional reactions on a purely neurological level.

In the brain, emotions can often be considered more base impulses that come from the inner middle parts of the brain, which is contrary to reasoned and advanced computing higher cortex. Although this model is not entirely wrong, it is important to recognize how closely supposedly 'rational' cognitive processes colored by an emotional experience. Thoughts and comprehension even on a cortical level are often rooted in emotional experiences, in the sense that, for example, while discussing the place of law and morality in civilization might seem like a completely separate and cortical functions that have never experienced emotional reactions such as pain or frustration judgments about what constitutes right and wrong has become impossible to make. That is the story of emotions in the brain, as a cross between the lower 'feeling' aspect, and the top 'conscious' aspect.

Regardless of an automatic behavior, human beings are not only cold automatic beings. Emotions are carriers of actions / activities. On the other hand, too strong emotions lead to people expressing excessive pain or excitement, which can trump over rational thinking and wisdom, influence perception, presentation and decision-making. Neuroscience has brought different conclusions about the "primacy of emotion" in many decisions, primarily on decisions related to money. Therefore, emotions can be useful but also harmful to traders. So, they need to check what emotions take part in decision-making and whether this will lead to rational / efficient attitudes, choices, and behavior or bias in the behavior. Methods which include a "reality check" (prefrontal cortex) and internal chemical secretions can lead to the primacy of emotion that can help against cold and unemotional thinking (Dr. Kaisa Hytonen, Finish Aalto University, 2015).

Biology of the brain

The dramatic events in the study of the brain and imaging technology rapidly advances our understanding of the human brain. Scientists using brain imaging technology now need only a few hours to assemble the kind of data from a normal human brain that previously took 20 years' inferential work in the lab with nonhuman primates. Furthermore, magnetic resonance imaging can now differentiate neuronal groups that are separated by only one millimeter (Blakeslee, 1993).

Our brain is made up of tens of millions of relatively small basic neural networks, and just like any type of immune antibodies react to a particular antigen of the environment, so that each neural network deals with a very specific element of the outside world- one sound, diagonal line. Various combinations of processes each of

these networks are very complex phenomena related, of phonemes and triangles to words and pyramids.

So, we have a modular brain, in the sense that it is a relatively small number of standard components that do not think but combine their data to create an incredibly complex cognitive environment. For example, when we look at the red ball rolling on the table, our brain processes color, shape, movement and position of the ball in four separate areas of the brain.

Genetic processes that have evolved over eons created the human brain that is fully equipped at birth with the basic senses / motor parts of a man who needs to successfully operate in the normal physical world. Our kind must hardwire the basic networks for survival (e.g., circulation, breathing, reflexes), but individuals also need flexibility, flexible or soft wired network, so they can respond to the specific challenges of the environment (to learn French or to drive a car).

When we are faced with economic and financial decisions, the question is how our brain functions are activated? Do we know the true underlying financial base of the brain? Is it deliberate? Is this logical? Or is it emotional? We still do not have definitive answers. In recent years we have a new way to look at decision-making on financial markets and risk-taking, are evaluated. Sometimes called neuroeconomics or neurofinance, which seeks to understand and to understand why we made certain financial choices, looking at activity in different parts of the brain, as well as a comprehensive approach to understanding. New discoveries are beginning to question the classical economic assumptions of economic rationality and market efficiency. Our brain seems to be capable of making financial predictions even when we have no knowledge of finance. This understanding of the causes can revolutionize financial modeling.

4. PEER EFFECT IN MAKING INVESTMENT DECISIONS

Neural activity was measured by functional magnetic resonance imaging fMRI which allows direct measurement of interest in the relative wealth of dynamic financial environments. This advantage gives us (researcher) a direct measurement at the time when the relative wealth changes without the potential bias that is driven by self-reference, it is necessary to emphasize the investigated data in the measurement of subjective resources as a function of relative gain (Luttmer, 2005; Card, 2012) are also effective. By applying economic theory and neural database to identify the mechanisms that generate peer effect. Neural activity was measured by functional magnetic resonance imaging fMRI which allows direct measurement of interest in the relative wealth of the dynamic financial environment. This advantage provides researchers direct measurement at the time when the relative wealth of changes without the potential bias that is driven by self-reference, it is necessary to emphasize the investigated data in the measurement of subjective resources as a function

of relative income (Luttmer, 2005; Card, 2012) also are also effective. The distinction between theory and application of neural databases are important in new tests of functional form of the utility over the relative wealth. The model predicted asset price where the investor has the advantage of obtaining the status of relative wealth (Rus-sanov, 2010), neural data runs the basic tests for the concave and convex functions by using time series variation in changing the relative wealth using functional magnetic resonance imaging. Data analysis this approach avoids obstacles in identifying peer effect. The experiment was conducted in strict laboratory conditions where the subjects randomly assigned to the peer group. All information that operators see all data transmitted between the entities thereby enabling control of common shocks in the peer group, excluding the two-part identification designed problems.

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In summary, conducted research provides insights into the high standards of laboratory protocols, neural database explains peer effects, observed neural activity is largely consistent with preferences for social status, but is not consistent with direct preferences for conformity or inequality aversion. Subjects showed strongest neural sensitivity to changes in the wealth of the peer which also show the highest peer effects in the behavior of trading. These studies contribute to the understanding of peer effect, because there are few studies that provide insights into the mechanisms of peer effect. We could set aside some authors such as Burstzyn et al., 2014, using an experimental design revealing preferences of investors for risky assets from personal assets at risk. He was able to conclude whether investors bought property due to social information or social usefulness. Both of these mechanisms can be seen as part of a peer effect in line with the data based on neuronal database.

The financial models of trading on financial markets mostly do not allow social interaction and communication with others. Yet in the real world individuals directly observe the behavior of others or learn about decision-making and other beliefs through conversations (Hirshleifer and Teoh, 2009). Empirical data shows that in the last fifteen years, social interactions have a significant impact on financial decision-making in a variety of contexts. This can be an example to show that peers can influence the participation of market shares (Hong et al., 2004; Brown et al., 2008),

the decision of saving for retirement (Duflo and Saez, 2003; Beshears et al., 2014), management mutual Fund selection shares (Hong et al., 2005; Pool et al., 2014) and the decisions of individual investors (Ivkovic and Weisbenner, 2007; Bursztyrn et al., 2014)

5. SUMMARY

Based on neuroscientific contribution in financial decision making, neurofinancial scientific theory was developed, where scientists are trying to penetrate the human brain and genetics that are behind the decision-making with tools that give us insights into the structure of the human brain. Research by J. Paulo Vietoa, Armando Freitas da Rocha Fabia T. Rocha on brain activity in making stock investment decisions and how we make financial decisions and many other authors include a complex set of neuroscientific research that provide insights interwoven in human behavior that ultimately lead to financial decisions. Most of academic theory of finance is based on the assumption that individuals act rationally and the behavior of finance treats the selection of investors on the basis of behavioral bias. However, neurofinance unlike the theory of finance tries to understand behavior by testing physiological processes in the brain when exposed to risk, uncertainty and awards. The scientific map of the human mind teaches us how fear and greed carry the financial market. Therefore, neurofinance is important for the future by developing a range of effective tools to improve financial decisions. Neurofinance can develop coherent models including scientific contributions to natural and social sciences.

The mechanisms that generate peer effect by including neural database which were researched by Cary Frydman, 2015 to construct new experimental tests to distinguish between competing preferences that are based on clarifying peer effect (study (conducted using neural database of experimental asset market that have tested the fundamental mechanisms that generate peer effect, the neural database was measured using functional magnetic resonance imaging (fMRI); Cary Frydman, 2015- University of Southern California-Marshall School of Business) relating to: experimental control in the laboratory of random peer assignment,; neural activity in testing new prediction explaining peer effect and neural activity in the conduct of trade.

The experimental results can be summarized:

Peer effect in the individual behavior of trading has been proven, and the neural databases are used for testing between competing mechanisms that generate these peer effects. The brain reacts to the moment when the subject is aware of investment decisions of their peers, because the brain knows how to encode the changes in the expected activities and the usefulness which is consistent with preferences for status. But the measure has limitations in not finding inequality aversion, because aversion to inequality shows a significant interaction with the economic environment in making financial decisions. The models of aversion inequalities that are based on reci-

procuity are important in the financial market that can be judged (Rabin, 1993). In the analysis of the peer effect in competitive settings of financial markets, are likely controlled through preferences for status than the inequality aversion. We conclude that experimental results are reduced to a narrow area of control provided by the laboratory setting. For example, a compilation mechanism for the effect of selective communication between the content of investors about the success or not of the failures leading bias that is closed in the experiment for making investment decisions of each entity in the social treatment and it is unconditionally sent to its peer. The question is to what degree of laboratory experiments are credible to the external real world. Of course, the sample taken measurements using functional magnetic resonance imaging are relatively small, which is a common criticism of neurofinance. Yet despite the shortcomings and partial access to investment decisions, the essence of this research relies on understanding the mechanisms of peer effects on which there is little information and research and a lot of unknowns in the methodology itself.

REFERENCE:

- Adolphs, R., et al., "Fear and the human amygdala", *The Journal of Neuroscience*, 15 (1995): 5879-91
- Adolphs, R., Tranel, D., & Damasio, A. R., "The human amygdala in social judgment", *Nature*, 393, (1998): 470-474
- Adolphs, R., Tranel, D., Damasio, H., & Damasio, A., "Impaired recognition of emotion in facial expressions following bilateral damage to the human amygdala", *Nature*, 372, (1994): 669-672
- Ahern, K. et al., "Peer effects in risk aversion and trust", *Review of Financial Studies*, forthcoming, (2014)
- Allman, J., et al., "The anterior cingulate cortex: the evolution of an interface between emotion and cognition" *Ann. NY Acad. Sci.* 935 (2001): 107-17
- Anderson, N. E., & Kiehl, K. A., "The psychopath magnetized: Insights from brain imaging", *Trends in Cognitive Sciences*, 16, (2012): 52-60
- Armando, F. R., et al. "Neurofinance: How do we Make Financial Decisions" (2013)
- Armony, J.L., LeDoux, J.E., "How the brain processes emotional information", *Ann NY Acad Sci.* 821, (1997)
- Atsak, P., et al., "Experience modulates vicarious freezing in rats: A model for empathy". *PloS One*, 6, e21855 (2011), <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3135600&tool=pmcentrez&endertype=abstract>, Accessed 29.05.13
- Bault, N., et al., "Interdependent utilities: how social ranking affects choice behavior". *PLoS One* 3(2008):e3477
- Bechara, A., et al. "Deciding advantageously before knowing the advantageous strategy", *Science* 275 (1997): 1293-95
- Behrens, T.E., et al., "Learning the value of information in an uncertain world" *Nature Neuroscience*, 10 (2007): 1214-21
- Bermudez, M. A., Schultz W., "Responses of amygdala neurons to positive reward-predicting stimuli depend on background reward (contingency) rather than stimulus-reward pairing (contiguity)", *The Journal of Neuropsychology*, 103(3), (2010): 1158-70
- Berns, G.S., et al., "Nonlinear neurobiological probability weighting functions for aversive outcomes.", *NeuroImage* 39 (2008): 2047-57
- Beshears, J., "The Effect of Providing Peer Information on Retirement Savings Decisions", Stanford University and NBER, James J. Choi Yale University and NBER David Laibson Harvard University and NBER Brigitte C. Madrian Harvard University and NBER Katherine L. Milkman University of Pennsylvania May 21, (2012)
- Beshears, J., et al., "The effect of providing peer information on retirement savings decisions", *Journal of Finance*, forthcoming (2014)
- Bicchieri, C., "The Grammar of Society: the Nature and Dynamics of Social Norms", Cambridge: Cambridge University Press, (2006)
- Bossaerts, M., Bossaerts, P., "Neurobiological studies of risk assessment: A Comparison of expected utility and mean-variance approaches", *Cognitive, Affective, and Behavioral Neuroscience*, 8, (2008): 363-374
- Bossaerts, P., et al., "Ambiguity in asset markets: theory and experiment" *Review of Financial Studies*, In press (2009)

- Bourgeois-Gironde, S., "Regret and the rationality of choices". *Philosophical Transactions of the Royal Society*, B. vol. 365, (2010):249-258
- Bourgeois-Gironde, S., Schoonover, C., "Cross-Talks in Economics and Neuroscience", *Review of Political Economics*, (2008): 35-50
- Bursztyn, L., "Understanding mechanisms underlying peer effects: Evidence from a field experiment on financial decisions", *Econometrica* 82, (2014), 1273-1301
- Cahill, L., et al., "Is the amygdala a locus of "conditioned fear? Some questions and caveats", *Neuron*, 23 (1999):227-228
- Campbell, J. Y., Cochrane, J. H., "By force of habit: A consumption-based explanation of aggregate stock market behavior", *Journal of Political Economy* 107, 1999): 205-251
- Caplin, A. et al., "Measuring beliefs and rewards: A neuroeconomic approach", *Quarterly Journal of Economics* 125, (2010): 923-960
- Card, D. et al., "Inequality at work: The effect of peer salaries on job satisfaction", *American Economic Review* 102, (2012): 2981-3003
- Christopoulos, G., et al., "Neural correlates of expected value, risk, and risk aversion contributing to decision making under risk" *The Journal of Neuroscience*, In press (2009)
- Chung, D. "Cognitive Motivations of Free Riding and Cooperation and Impaired Strategic Decision Making in Schizophrenia During a Public Goods Game" (2013)
- Damasio, A. et al. "Somatic markers and the guidance of behavior: theory and preliminary testing", in H.S. Levin, H.M. Eisenberg & A.L. Benton (Eds.). *Frontal lobe function and dysfunction*. New York: Oxford University Press, (1991): 217-229
- Damasio, A., "The Feeling of What Happens: Body and Emotion in the Making of Consciousness: Harcourt Brace", (1999)
- De Martino, B., et al. "The neurobiology of reference-dependent value computation", *The Journal of Neuroscience*, 12 (2009): 3833-42
- De Martino, B., et al., "Frames, biases, and rational decisionmaking in the human brain" *Science* 313 (2006): 684-87
- Duflo, E., Saez, E., "Participation and investment decisions in a retirement plan: the influence of colleagues' choices", *Journal of Public Economics* 85 (2002): 121-148
- Frydman, C. et al., "Using neural data to test a theory of investor behavior: An application to realization utility", *Journal of Finance* 69, (2014): 907-946
- Frydman, C., Camerer, C., "Neural evidence of regret and its implications for investor behavior", *Working Paper* (2015)
- Goense, J. B. M., Logothetis, N. K., "Neurophysiology of the BOLD fMRI signal in awake monkeys", *Current Biology*, 18 (2008): 631-40
- Hare, T. A., et al., "Dissociating the role of the orbitofrontal cortex and the striatum in the computation of goal values and prediction errors.", *The Journal of Neuroscience*, 28(22), (2008): 5623-30
- Hare, T. A., et al., "Dissociating the role of the orbitofrontal cortex and the striatum in the computation of goal values and prediction errors", *The Journal of Neuroscience*, 28 (2008): 5623-30

- Hollerman, J. R., et al., "Influence of reward expectation on behavior-related neuronal activity in primate striatum.", *The Journal of Neuropsychology*, 80(2), (1998): 947-63
- Ivković, Z., Weissenberger, S., "Information diffusion effects in individual investors' common stock purchases: *Covet thy neighbors' investment choices*", *Review of Financial Studies* 20, (2007): 1327-1357
- Knutson, B., et al. "Distributed Neural Representation of Expected Value", *Journal of Neuroscience* 25 (19), (2005): 4806-4812
- Kosfeld, M., et al., "Oxytocin increases trust in humans", *Nature* 435 (7042) (2005): 673-676.
- Kuhnen, C. M., Knutson, "B. *Journal of Financial and Quantitative Analysis*", Vol. 46, No. 3, Michael G. Foster School of Business, University of Washington, Seattle, Wa, (2011): 605-626
- Kuhnen, C., Knutson, B., "The Neural Basis of Financial Risk Taking", *Neuron*, 47, (2005): 763-770
- LeDoux, J., "The Emotional Brain", New York: Simon & Schuster, (1996)
- Lo, A. W., Repin, D. V., "The psychophysiology of real-time financial risk processing", *Journal of Cognitive Neuroscience*, 14 (2002): 323-39
- Lo, A. W., Repin, D. V., "The psychophysiology of real-time financial risk processing", *Journal of Cognitive Neuroscience* 14, (2002): 323-339
- Mason, M. F., Dyer, R., and Norton, M. I. "Neural mechanisms of social influence", *Organizational behavior and human decision process*, 110, (2009): 152-159
- McClure, S. M., et al., "Temporal prediction errors in a passive learning task activate human striatum", *Neuron* 38 (2003): 339-46
- McClure, S., et al., "Separate Neural Systems Value Immediate and Delayed Monetary Rewards", *Science*, 306, (2004): 503-507
- O'Neill, M., Schultz W., "Risk prediction error coding in orbitofrontal neurons.", *The Journal of Neuroscience* 33(40), (2013): 15810-4
- Paulus, M.P., et al. "Increased activation in the right insula during risk-taking decision making is related to harm avoidance and neuroticism", (2003)
- Rolls, E.T., "The Brain and Emotion", Oxford University Press (1998)
- Romo, R., Schultz, W., "Role of primate basal ganglia and frontal cortex in the internal generation of movements. III. Neuronal activity in the supplementary motor area.", *Experimental Brain Research* 91(3) (1992): 396-407
- Romo, R., Schultz, W., "Role of primate basal ganglia and frontal cortex in the internal generation of movements. III. Neuronal activity in the supplementary motor area.", *Experimental Brain Research* 91(3), (1992): 396-407
- Sanfey, A. G., "Social decision-making: insights from game theory and neuroscience", *Science* 318, (2007): 598-602
- Schultz, W., "Updating dopamine reward signals.", *Current Opinion in Neurobiology*, 23(2), (2013): 229-38
- Schultz, W., Dickinson, A., "Neuronal coding of prediction errors.", *Annual Review of Neuroscience*, 23 (2000): 473-500
- Singer, T., Critchley, H. D., and Preusschoff, K., "A common role of insula in feelings, empathy and uncertainty", *Trends in Cognitive Science* 13, (2009): 334-340

- Stallen, M., Smidts, A., and Sanfey, A. G., "Peer influence: neural mechanisms underlying in-group conformity", *Frontiers in Human Neuroscience* (2013): 7:50
- Suri, R. E., Schultz, W., "A neural network model with dopamine-like reinforcement signal that learns a spatial delayed response task.", *Neuroscience* 91(3), (1999):871-90
- Tieu, K.H., et al. "Perirhinal-amygdala circuitlevel computational model of temporal encoding of fear conditioning", *Psychobiology*, 27 (1999): 1-25, 84
- Tom, S.M., et al., (2007) "The neural basis of loss aversion in decision-making under risk", *Science* 315 (5811) (2007): 515-518
- Tversky, A., Kahneman, D., "Judgment under uncertainty: Heuristics and biases", *Science* 185, (1974): 1124-1131
- Ullsperger, M., et al., "Conscious perception of errors and its relation to the anterior insula", *Brain Structure Functions* 214, (2010): 629-643
- Volz, K.G., et al. "Predicting events of varying probability: uncertainty investigated by fMRI", *NeuroImage* 19, 2 Pt 1, (2003): 271-280

2
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1
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