ISSN 2712-0562
Sustainable Engineering and Innovation *Original Research*
Vol. 1, No. 1, June 2019, pp.24-33
https://doi.org/10.37868/sei.v1i1.96

Impact of quality and innovation strategies on business performance of Bosnian B2B and B2C companies

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Abstract
The aim of this paper was to compare two business models, namely business to business and business to customer. The first model is oriented towards the delivery of intermediate goods ordered by an immense foreign market leader that is outsourcing a part of its business. The second model is consumer oriented and is more about innovation and the creation of goods ready to be immediately sold on the market. Bosnia is a developing country, and often a place for establishing B2B businesses. However, we are lacking in innovation, our own know-how, and the creation of challenging business opportunities. It also faces the problem of brain drain; therefore, it needs a plan for retaining the youth within the country. The analysis aimed to show how the boosting jobs and living standards in Bosnia are affected by the investments, exports, and salaries within the B2B and B2C companies. The results showed that Bosnia has a significant potential for raising living standards, employment and salary, if investments are directed towards innovations, knowledge-intensive and B2C businesses instead of labor-intensive investments.

Keywords: : B2B, B2C, Employment, Exports, Innovation, Quality

1. Introduction

Quality and innovation have traditionally been seen as competing rather than complementary goals. *'Quality is doing things better; innovation is doing things differently'*. Some argued that quality management focuses on incremental improvement and satisfying existing customers whereas innovation management emphasizes breakthrough improvements in products and processes and focusing on acquiring new customers [1]. Quality management can be utilized to deliberately help the administration of advancement. Apparatuses for quality management can be valuable in creating the conditions in which innovations can be developed, monitoring, and improving the entire innovation process, revising the content of innovation, and implementing the innovation strategy [2]. Supply chain management and its importance increased over the last decade [3]. The term is a popular topic among researchers and is usually described as responsibility sharing across the company [4]. Supply chain can be defined as a set of activities executed by at least three entities within the organization that are involved in delivering products, services, finances from the source to the final consumer [5]. The supply chain has the idea of linking all the contributors in converting raw materials into finished products [6]. The right business model is very important for having business successful. Which model a company will use, depends on the decision whether it wants to produce intermediate products, or produce domestic products delivered to its customers on the market [7]. It is important for every company to be ready

to fail in some parts before it finally manages to optimize its business [8]. Creating a value for the market is not an easy task, and for that, one needs to make deep research about the market, the resources available, to utilize the potential of the youth as well as to be ready to undertake entrepreneurial moves [9]. Business to business models are common for the large companies, whose part of the business is outsourced to lower wage countries, since they reduce their cost of production. At certain point, the living standard in lower wage countries the standard increases and works ask for higher wages [10]. This paper aimed to analyze the position of these two business models by examining the Agricultural, Energy, Mining, Manufacturing, and IT sectors in Bosnia with the aim to determine which business model provides higher benefit to the country. Specifically, the research paper investigates the influence of quality management systems [1] and innovation strategies on the performance of B2B and B2C oriented companies in Bosnia. For the purpose of this study, companies from Bosnia are classified into two groups: the first group consists of companies using business-to-consumers model (B2C), meaning that the companies are producing goods that can be immediately sold to the end-users for the consumption [11]. Food, furniture, defense products and electricity are some examples of companies that can deliver this sort of product. The second group of companies consists of companies using the business-to-business model (B2B). These companies are usually producing intermediate goods, which are further used in value chain such as manufacturing process. Supply chain consists of all parties contributing to value creation including suppliers of raw materials, intermediate goods producers, assembly companies and distributors [12]. Companies in Bosnia which use this model are generally part of the supply chain and they are export oriented. These companies are more labor intensive and operate under the following tasks:

- the production is concentrated on delivering products that are someone else's design (use of supply chain to reduce the costs of production) [13],
- they are a part of the supply chain, and they rely on a few core buyers [14],
- they do not generate revenue from own know-how, they generate revenue dominantly from labor,
- they live in a fear to lose their core buyers, since losing them might mean the end of their business [15].

The mutual interests of both groups are to reduce the business risk to the minimum, to become more competitive in the market and get a better margin from sales.

Some solutions can be proposed for this problem. One of them is to invest in innovation and new product development. Bosnian supply chain companies are mostly in the metal industry. There is very little built-in domestic know-how in the products and services they are delivering, and therefore the profit margin is low. For this reason, investments in innovation need to be undertaken to increase the competitiveness and to increase the profit margin [16]. Profit margin is proportional to the embedded knowledge. This means that the more knowledge that is embedded in the product, the higher margin will be achieved. The focus should be on the development of end-user products. These products increase the margin as well. If success in developing the end-user products is achieved, as a result the dependency on the core customers would be reduced.

Supply chain disruptions affect all participants involved in the process [17]. One situation on Germany automotive industry sector can be taken as example. Namely, Robert Bosch, the largest auto – parts supplier experienced serious disruptions in the supply chain in 2005. They detected problems with the sockets produced by another company within the supply chain. This resulted in severe losses and a pause of assembly process [14].

Creation of end-user products should be supported with IT advancements. Supply chain management has greater efficiency in use and operating with IT advancement. This could enable the domestic companies to respond to market demands quicker and give them and easy time developing end-user-oriented goods [18].

The key for success is to develop the domestic know-how [19]. They should look at the potential of youth at universities, and look for establishing cooperation with higher education institutions, to keep the future of this country within the borders and to create competitive businesses [20]. Besides, this sort of knowledge might have a creative approach and create new ways of problem solving [21].

There are many researchers concerned with these topics. The importance of these studies is seen in the role they are having while adopting laws and policies regarding the economic development of the country or sector [22]. Investing in product quality development will result in lower level of imports, and generally, the dependency on core customers for intermediate export goods produced domestically [22]. The simplest demand model of being a function of relative prices and income can be upgraded [22]. Owen and Wren-Lewis [23] showed in their research market improvements of the UK during the 1980s which resulted in enlarged exports. This was the result of high investment as well as Research and Development measures. Countries with higher income elasticities have higher variety of products produced domestically and exported [23] [24]. Besides the development of new products, innovation is also important in the improvement of already existing goods and services produced domestically because the innovation becomes obsolete over time [25]. Development of supply chains for end-user goods needs regular revision and updates [26]. To come up with the best proposals for investment direction, domestic market should be carefully studied and understood [27].

This paper will be focused on grouping companies in two categories B2C and B2B and investigating the differences between these two groups of Bosnian companies as well as certain relationships. Variables that were analyzed are **net salaries**, **total employment**, **investments, education, and export**. The influence of *export*, *investment* and *education* (explanatory variables) to *net salaries* as well as to the *employment* (dependent variables) were investigated for each group category. Data for this research was taken from Agency for Statics of Bosnia for period of 2003 to 2018 [28] [29] [30] [31]. Therefore, the following hypotheses were tested:

- H1: ($\mu_1 > \mu_2$) - B2C (μ_1) companies are more successful than B2B (μ_2) ($\mu_1 > \mu_2$),
- H2: ($\mu_1 > \mu_2$) - B2C (μ_1) is better-paid sector than B2B (μ_2),
- H3: ($\mu_1 < \mu_2$) - Employment in B2C (μ_1) is significantly lower than in B2B (μ_2).
- H4: ($\mu_1 > \mu_2$) - B2C (μ_1) are more-attractive to more-qualified workers then B2B (μ_2).
- H5: At least one explanatory variable is significant contributor to the level of employment and the net salaries in B2B category.
- H6: At least one explanatory variable is significant contributor to the level of employment and the net salaries in B2C category.

Significance and scope of this research is detecting the problems in Bosnian market (including labor market) and discussing possible solutions. One of the major problems of the labor market in Bosnia is the brain drain. Which sector, B2B or B2C is more successful and more attractive for the local labor market is also the subject of this paper. Highly qualified people, especially youth, are leaving the country and finding better paid jobs abroad. Some parts of Bosnia facing the lack of workers in manufacturing and service sectors [32]. As one of the extreme examples happened recently is a B2B company that published a vacancy for 400 positions in manufacturing, but they received two applications only [33]. Therefore, the biggest challenge in upcoming period for Bosnian industry will be to make themselves more attractive for workers.

As limitation of this study, it is important to say that we have faced several obstacles in our research such as: very limited data from statistical agencies in Bosnia were available, inconsistency of data obtained from two Bosnian entities. Thus, each data set was analyzed for the available time conclusions were drawn.

2. Research method

The research method in this study is based on hypothesis testing. These tests were done with assumption that a hypothesis is true [34]. To conclude whether hypothesis can be accepted or rejected, test statistics based on *t*-test and regression are applied.

T-test and ANOVA

The methods for calculating test statistics used in this work are *t*-test and ANOVA testing. The *t*-test is used to calculate and determine whether two examples are significantly different from each other. Another method

used for calculating statistical data is ANOVA testing [35]. The principle of ANOVA is similar to the *t*-testing, but with difference that this testing is used when we want to calculate and find out the significance of more than two samples. In addition, ANOVA testing involves several more formulas when calculating the dataset [36]. The following represent the formulas and steps in calculating both *t*-test and ANOVA.
Total sum of squares for ANNOVA is calculated as follows:

$$SS_T = SS_{Tr} + SS_E \tag{1}$$

Where, SS_{Tr} is sum of square from treatments and SS_E is sum of squares from error.
Based on [36] the previous formula can be written as:

$$\sum_{i=1}^{a}\sum_{j=1}^{n}\left(y_{ij} - \bar{y}_{..}\right)^2 = n\sum_{i=1}^{a}(\bar{y}_{i\cdot} - \bar{y}_{..})^2 + \sum_{i=1}^{a}\sum_{j=1}^{n}\left(y_{ij} - \bar{y}_{i\cdot}\right)^2 \tag{2}$$

where, y_{ij} represents ij-th observation taken for the group i, $\bar{y}_{i\cdot}$ average of group i, $\bar{y}_{..}$ average of all group averages (grand average), n is sample size, a is number of groups. Finally, observed F statistic can be calculated as:

$$F_o = \frac{SS_{Tr}/(a-1)}{SS_E/[a(n-1)]} = \frac{MS_{Tr}}{MS_E} \tag{3}$$

where, $(a-1)$ represents degrees of freedom between groups, $a(n-1)$ represents degrees of freedom within the groups, MS_{Tr} is mean square of treatments and MS_E is mean squares of error.
If the observed value of F_o from Equation (3) is less than critical value taken from table ($F_o > F_{cr}$ or p-value < α), it indicates that the model is statistically significant, which means that at least one significant difference exists between the groups, otherwise significant differences do not exist. This test does not tell which pairs differ significantly if it is the case. To determine significant differences between the pairs, a post-hoc *t*-tests comparison needs to be used. Observed *t*-test statistics is determined as follows:

$$t_o = \frac{\bar{x}_1 - \bar{x}_2 - \Delta_0}{\sqrt{\frac{{s_1}^2}{n_1} + \frac{{s_2}^2}{n_2}}} \tag{4}$$

where, $\bar{x}_1$ and $\bar{x}_2$ represent the mean values of group one and group two, Δ_o is hypothesized mean difference, which is set to be zero in this case, s_1 and s_2 are variances of each group, while n_1 and n_2 represent sample size for each group.
Generally, if the observed t_o value is less than t_{cr} value taken from statistical table ($t_o > t_{cr}$ or p-value < α), it indicates that there is significant difference between the groups. Since there is more than one comparison in this study, post hoc *Bonferroni* correction is applied for level of significance *α*. The primary purpose of the *Bonferroni* correction is to correct the probability values when making multiple statistical tests so as to avoid type I error. The model introduced by Carlo *Bonferroni*, has become popular in using and widely applicable in many experimental contexts, among which are comparison of groups with the baseline, measuring the relationship among the variables, examining more than one end point and clinical trials [37] [38] [39]. So, the significance level *α* needs to be lowered by the number of comparisons being performed. To perform the correction, the critical value $P(\alpha)$ is divided by the number of comparisons made (k). The result becomes a new statistical value for comparisons [40].

$$\alpha^* = \frac{\alpha}{k} \tag{5}$$

Where, α^* is *Bonfferoni* corrected significance level, *α* the original significance level and k is number of comparisons. Number of comparisons is calculated as:

$$k = \frac{n*(n-1)}{2} \tag{6}$$

where, n is sample size.

This research is based on comparison of seven groups thus, the number of comparisons is determined as follows:

$$k = \frac{n*(n-1)}{2} = \frac{7*(7-1)}{2} = 21 \quad (2) \qquad (7)$$

Applying the *Bonferroni* Correction, the new significance level is

$$\alpha^* = \frac{\alpha}{k} = \frac{0.05}{21} = 0.00238 \qquad (8)$$

Therefore, hypotheses tested with ANOVA and *t*-test are the following:

Multiple linear regression model

In addition to comparison tests, multiple regression was used for understanding whether the relationship between independent variables and the dependent variable exists [36]. Here it was done to understand does the independent variable shape the deepened or in other words does it affect negatively or positively. A general multiple linear regression model with *k* regressor variables can be written as:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_k x_k + \varepsilon \qquad (9)$$

where, y is response variable, β_j, β_j, $j = 0, 1, 2, \ldots, k$, are slopes or estimated parameters that influence change in response variable, x_j is regressor variable or input variable, ε is random error. The general multivariate linear regression model in matrix form can be written as follows [36]:

$$\begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_n \end{bmatrix} = \begin{bmatrix} 1 & x_{11} & x_{12} & \cdots & x_{1k} \\ 1 & x_{21} & x_{22} & \cdots & x_{2k} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 1 & x_{n1} & x_{n2} & \cdots & x_{nk} \end{bmatrix} \begin{bmatrix} \beta_0 \\ \beta_1 \\ \vdots \\ \beta_k \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \vdots \\ \varepsilon_n \end{bmatrix} \qquad (10)$$

Estimated β parameters are obtained in the way that sum of squared errors ε^2 is minimized. Solving the following matrix beta parameters are obtained:

$$\hat{\beta} = (X'X)^{-1}X'Y \qquad (11)$$

To test significant relationship between input variables and output variables it is assumed that a least one β parameter differs from the others.

$$\begin{aligned} &H_0: \beta_1 = \beta_1 = \ldots \beta_k = 0 \\ &H_{alternative}: \beta_j \neq 0 \text{ for at least one } j. \end{aligned} \qquad (12)$$

3. Results and discussion

3.1. Difference analysis

To test the differences-based hypotheses, B2C and B2B companies were assessed per three criteria: *export*, *employment* and *investment*. Table 1 shows *t*-test results based on H1 hypothesis.

Table 1. Performance of B2C and B2B companies in export and investment

Export x10^3 KM	*B2C*	*B2B*	*Test*	*P-value*
Mean	1,570,837.55	682,664.92	*t*-test	0.0003*
Variance	429,47,918,697	12,878,227,423	*F*-test	0.174
Investment x10^3 KM	*B2C*	*B2B*	*Test*	*P-value*
Mean	1,030,231.4	1,265,209.2	*t*-test	0.155
Variance	1.23084E+11	1.136E+11	*F*-test	0.469

*Significant at $p = 0.05$

Bases on Table 1, although B2B companies employ a significantly larger number of workers (see Table 3), B2C companies are significantly more successful in the field of exports. More exports make more money for the country and reduce the deficit. Therefore, the B2C model should be crucial for investors who intend to invest money in a new business. Although B2B companies are slightly more attracted to investors, there is no significant difference between investing in B2B and B2C companies. Overall, with this analysis the H1

hypothesis is partially proved. Another important criterion is the average salary. The analysis which group of companies has better average salaries is shown in Table 2.

Table 2. Difference in net wage

Net wage	*B2C*	*B2B*	*Test*	*P-value*
Mean	1208.36	731.8	*t*-test	1.83E-07
Variance	1,565.76	449.05	*F*-test	0.005

*Significant at $p = 0.05$

It was observed that significantly higher net average salaries are associated with B2C than with B2B companies, thus B2C companies might be attractive to local employees. Although B2C have significantly higher salaries, there is a significantly higher variation of salaries associated with these companies than with B2B. Based on this finding H2 was supported and it is expected that B2C are more attractive to employees. Bosnian B2B companies are mainly labor intensive an it is expected that the employs more people than B2C. Table 3 shows an average employment in Bosnian B2B and B2C over years.

Table 3. Difference in total number of employees

EMPLOYMENT	*B2C*	*B2B*	*Test*	*P-value*
Mean	101,392.7	167,130.2	*t*-test	0.0002
Variance	3,122,694	3.35E+08	*F*-test	0.0000

*Significant at $p = 0.05$

The results show that the average employment in Bosnian B2C over the years is significantly lower than in B2B companies. This analysis support H3 hypothesis with $P = 0.0002$. F-test confirmed a significantly higher fluctuation of work forces is associated with B2B companies. This is expected since their B2B companies are mainly labor intensive and operate in the manufacturing sector making components for automotive industry and the other big companies abroad. So, they are part of somebody else's system and they do not offer their own unique systems or solutions. Based on the abroad companies demand local B2B companies frequently hire or fire employees making a high fluctuation of workers. This way the local B2B companies are more likely a part of their solution, instead of providing their own solutions. This is another reason why this sector is not attractive for local employees. Paying a higher wage encourages those who are hired not to be lazy or in another way jeopardize an attractive job. Paying above market wages to attract and retain more-productive workers is called ***efficiency wages***, which was done the first time by Henry Ford with invention of the assembly line. The *efficiency wages* are way to attract skilled workers and motivate existing workers to increase productivity and reducing employee turnover [41]. Additionally, this was investigated by analyzing the educational background of employees in each group, and it was found that there is significant difference in employee education between B2B and B2C companies. Table 4 show statistical results for number of employees with a higher education.

Table 4. Difference in the number of employees with a higher education

Higher Education	*B2C*	*B2B*	*Test*	*P-value*
Mean	42,963.31	28,050.36	*t*-test	0.0001
Variance	1,344,430	8,470,415	*F*-test	0.05

*Significant at $p = 0.05$

The average number of employees with higher education over the years is significantly higher in B2C companies. This fact supports H4 hypothesis, and it can be said that Bosnian B2C companies are more knowledge intensive. As that, these companies are more oriented towards creating added value through providing solutions in which the share of know-how is significantly represented. It is expected that B2Cs will make better selling margin and they can afford higher salaries for their employees, which makes them more attractive to more-qualified workers. The influence of *export*, *investment* and *education* (explanatory

variables) to *net salaries* as well as to the *employment* (dependent variables) were investigated for each group category.

3.2. Relationship analysis

Hypothesis (H5) was tested using multiple regression model. The goal is to investigate whether any of the regressors (*export, investment* and *education*) is significant related to the number of employees or net salaries. Applying multiple multivariate linear regression on each category of Bosnian companies there were found certain significant relationships. The results are shown in Table 5. Correlations among variables were investigated and the discussion is comprised of two parts involving the analysis of sectors in Bosnia.

Table 5. Influence of regressor variables on the net wage in B2B category

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	2268.13	57.18	39.67	0.00
Export	3.375E-06	0.00018	0.02	0.99
Investment	0.0009912	0.00022	4.44	0.02*
Higher Edu	0.0008642	0.00102	0.85	0.46

*Significant at $p = 0.05$

Based on Table 5, observed ANOVA is significant ($F > Fcr$) suggesting that at least one regressor is significant contributor to the net wage. Looking at multiple regression results, it was observed that the investment in B2B companies significantly contributes to increasing net salaries. Also, a significant relationship was not found between the regressor variables (*export*, *investment* and *education*) and *employment* in B2B companies. Table 6 shows the influence of *export*, *investment* and *education* on the *net wage* in B2C companies.

Table 6. Influence of regressor variables on the net wage in B2C category

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	2290.05	268.32	8.53	0.00
Export	-0.00259	0.00121	-2.15	0.12
Investment	0.00042	0.00012	3.38	0.043*
Higher Edu	0.06415	0.01973	3.25	0.047*

*Significant at $p = 0.05$

Based on Table 6, observed ANOVA is significant ($F > Fcr$) suggesting that at least one regressor is significant contributor to the net wage in B2C category. Also, multiple regression results show that the investment in B2C companies and hiring more skilled workers significantly contribute to the increase of the net salaries in B2C category.

Table 7. Influence of regressor variables on the employment in B2C category

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	5139.81	7263.02	0.71	0.53
Export	-0.0520	0.0326	-1.60	0.21
Investment	0.0078	0.0033	2.35	0.10
Higher Edu	1.6256	0.5340	3.04	0.045*

*Significant at $p = 0.05$

Also, a significant positive relationship was found between the education degree and the employment in B2C category. This is expected since this category has a significantly higher number of workers with a higher education. This implies that B2C companies are attracting more skilled people with a higher educational degree. The results are show in Table 7.

4. Conclusion

Bosnian industry faces problem of retaining its workforce, especially the youth. The country currently faces the problem of brain – drain, and it uses its future workforce. The country is also at the expense of educating

those people and letting them go. Young people are educated and speak foreign languages and they look for more attractive jobs for them in EU countries and over the globe. Our analysis aimed to show that the B2C sector is better for both the country and its citizens than B2B. B2B companies in Bosnia are usually lower paid jobs, and work done for some other giant foreign market leader. In order to stabilize the situation, the country should invest in B2C companies that pay higher wages, contribute to domestically created goods and make the people live and work here. B2B employs a significantly larger number of workers (where the number with higher education employees is significantly lower than in B2C), they have significantly lower wages and significantly lower exports. The reason is that B2B companies are mainly labor intensive and have lower margin compared to B2C. It is expected that Bosnian B2Bs make a small margin and accordingly they pay lower wages. As consequence, the major problem today associated with Bosnian B2Bs is lack of qualified workers. Local workers are increasingly finding more attractive and better paid jobs around the world since the local B2B are less attractive to them. It has also been observed that investment in B2B companies is a significant contributor to the increase in net salaries. B2C companies in total employ significantly lower numbers of workers but they are also significantly more attractive to more-skilled workers, they pay significantly higher wages, and they are significantly more successful in exports. The reason is that B2Cs are predominantly based on creating added value that includes know-how and brands, dominantly offer solutions and they are rarely part of someone's solutions. Therefore, it is expected that B2C companies will achieve higher margins and that they can afford attractive salaries for their employees. Also, this study showed that that investment in B2C companies and hiring more skilled workers significantly contribute to the increase of net salaries in B2C category. A significant positive relationship was found between the level of education and the number of employees in B2B companies, which implies that B2C are more knowledge intensive companies and as such they are more successful in business.

Overall, owners of capital from Bosnia are still not aware that they overnight become a part of the global labor market. Thus, they cannot look for only for recruiting local people they have to start looking for people from the global market. Currently the business they are running (especially B2B) is mainly labor intensive and there is not enough potential to be sustainable and to attract workers and engineers from the global market as well. Therefore, to be able to attract people from the global labor market, the businesses they are running must have potential to increase salaries and benefits to be more attractive. Currently the business is predominantly labor intensive and has no potential to make salaries and benefit packages more attractive. Thus, this is a warning sign for business owners to act as soon as possible to revise their business strategies. On this track, B2B companies must start thinking about diversification to less labor-intensive forms of business. They should start creating innovative products and services to create extra margin from know-how and branding. By creating and selling know-how, employers will generate significant added value and margin, thus they will make themselves more attractive for young workers, engineers, managers, etc. all over the world.

References

[1] B. Durakovic, H. Basic and H. Muhic, "The Interrelationships between Quality Management Practices and Their Effects on Innovation Performances," in *Trends in The Development of Machinery and Associated Technology TMT 2014*, Budapest, 2014.

[2] B. .A.G., "The strategic function of quality in the management of innovation," *Total Quality Management* , vol. 13, no. 2, pp. 195-205, 2002.

[3] C. M. C., L. M. Ellram, J. T. Gardner and A. M. Hanks, "Meshing Multiple Alliances," *Journal of Business Logistics*, vol. 18, no. 1, pp. 67-89, 1997.

[4] L. Londe and B. J., "Supply Chain Management: Myth or Reality," *Supply Chain Management Review*, vol. 1, pp. 6-7, 1997.

[5] J. T. Mentzer, W. D. Witt, J. S. Keebler, S. Min, N. W. Nix, C. D. Smith and Z. G. Zacharia, "Defining Supply Chain Management," *Journal of Business Logistics* , vol. 22, no. 2, pp. 1-25, 2001.

[6] W. C. Copacino, "Supply Chain Management ; The Basics and Beyond," *Boca Raton, FL: St. Luice Press/ APICS Series on Resource Manaement*, p. 5, 1997.

[7] B. S. a. I. Business Models, "David J. Teece," *Long Range Planning*, vol. 43, pp. 172-194, 2010.

[8] R. Rosenbloom and W. Spencer, "Engines of Innovation: Industrial Research at the end of an Era," *Harvard Business School Press*, 1996.

[9] H. Chesbrough and R. S. Rosenbloom, "The role of business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies," *Industrial and Corporate Change*, vol. 11, no. 3, pp. 539-555, 2002.

[10] S. Streukens, S. Hoesel and K. Ruyter, "Return on marketing investments in B2B customer relationships: A decision-making and optimization approach," *Industrial Marketing Management*, vol. 40, no. 1, pp. 149-161, 2011.

[11] R. Amit and C. Zott, "The fit between product market strategy and business model: implications for firm performance," *Strategic Management Journal* , vol. 29, pp. 1-26, 2008.

[12] J. D. Wisner, "A Structural Equation Model of Supply Chain Management Strategies and Firm Performance," *Journal of Business Logistics*, vol. 24, no. 1, pp. 1-26, 2003.

[13] A. Desphande, "Supply Chain Management Dimensions, Supply Chain Performance and Organizational Performance: An Integrated Framework," *International Journal of Business and Management* , vol. 7, no. 8, pp. 2-19, 2012.

[14] S. M. Wagner and C. Bode, "An empriical investigation into supply chain vulnerability," *Journal of Purchasing and Supply Management*, vol. 12, pp. 301-312, 2006.

[15] D. Y. Hamel, "Alliance Advantage," *Harvard Business School Press*, 1998.

[16] R. T. Rust, C. Moorman and P. R. Dickson, "Getting Return on Quality: Revenue, Expansion, Cost Reduction, or Both?," *Journal of Marketing*, vol. 66, pp. 7-24, 2002.

[17] L. A., "Trial by fire: a blaze in Albaquareque sets sets off a major crisis for cell-phone giants," *Wall Street Journal*, 2001.

[18] F. Wu, S. Yeniyurt, D. Kim and S. T. Cavusgil, "The impact of information technology on supply chain capabilities and firm performance: A resource-based view," *Industrial Marketing Management*, vol. 35, pp. 493-504, 2006.

[19] N. Paskin, "Toward Unique Identifiers," *Proceedings of the IEEE*, vol. 87, no. 7, pp. 1208-1227, 1999.

[20] F. Ellis, "Household Strategies and Rural Livelihood Diversification," *The Journal of Development Studies*, pp. 2-3, 2007.

[21] A. Hargadon and R. I. Sutton, "Technology Brokering and Innovation in a Product Development Firm," *Administrative Science Quarterly*, vol. 42, no. 4, pp. 716-749, 1997.

[22] B. Anderton, "Innovation, product quality, variety, and trade performance: an empirical analysis of Germany and the UK," *Oxford Economic Papers* , vol. 51, pp. 152-167, 1999.

[23] K. P., "Differences in income elasticities and trends in real exchange rates," *European Economic Review*, vol. 33, pp. 1031-54, 1989.

[24] G. G. and H. E., "Technology and trade," *Handbook of International Economics*, vol. 3, 1995.

[25] K. P., "New theories of trade among industrial countries," *The American Economic Review, Papers and Proceedings*, vol. 73, pp. 343-7, 1983.

[26] A. Wieland, R. B. Handfield and C. F. Durach, "Mapping the Landscape of Future Research Temes in

Supply Chain Management," *Journal of Business Logistics*, vol. 37, no. 3, pp. 205-212, 2016.

[27] C. Freeman, "The Economics of Industrial Innovation," 2009.

[28] Agencija za statistiku BiH, "Economic statistics," Agencija za statistiku BiH, Sarajevo, 2003-2018.

[29] Agencija za Statistiku BiH, "Demography and social statistics - Natural population change and marriages," Agencija za Statistiku BiH, Sarajevo, 2018.

[30] Agencija za statistiku BiH, "Demography and social statistics - Education statistics," Agencija za statistiku BiH, Sarajevo, 2003-2018.

[31] Agencija za statistiku BiH, "Demography and social statistics - Internal migration in Bosnia and Herzegovina (in period 2008-2017)," Agencija za statistiku BiH, Sarajevo, 2017.

[32] B. Živanić, *Na oglase za zapošljavanje vozača više se niko ne javlja,* Banja Luka: Nezavisne novine, September, 2018.

[33] N. novine, *Tražili 400, našli dva radnika,* Banja Luka: Nezavisne novine, December, 2017.

[34] D. W.W, in *Biostatistics: a foundation for analysis in the health sciences*, 1999, pp. 324-326.

[35] M. D. C., in *Introduction to statistical quality control*, 2009.

[36] B. Durakovic, "Design of Experiments Application, Concepts, Examples: State of the Art," *Periodicals of Engineering and Natural Scinces,* vol. 5, no. 3, p. 421–439, 2017.

[37] N. J. and P. E.S., "On the use and interpretation of certain test criteria for purpose of statistical inference," *Biometrika* , vol. 20A, pp. 175-240, 1928.

[38] D. O.J., "Multiple Comparison Among Means," *I Am Stat Assoc,* vol. 56, pp. 52-64, 1961,.

[39] S. D.L. and N. G.R., "Correction for Multiple Testing: Is There a Resolution?," *Chest,* vol. 140, pp. 16-18, 2011.

[40] A. RA, "When to use the Bonferroni corrrection," *Ophthalmic Physial Opt*, vol. 34, pp. 502-508, 2014.

[41] W. A. McEachern, Economics: A Contemporary Introduction, 10th Edition ed., Mason: Cengage Learning, 2012.