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Pass-through effects of exchange rate on inflation: The case of Turkey

[a]Utku Altunöz

[a]Sinop Üniversitesi, Boyabat İİBF, Ekonomi Bölümü

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ABSTRACT

In this study, the effect of the exchange rate on inflation in Turkey is examined. ARDL Boundary Test is preferred for the 2010-2018 period. Domestic producer price index (PPI) were used as the dependent variable and weighted nominal exchange rate (EXC), world crude oil prices (OIL), domestic money supply (M3) and the capacity utilization rate (CUR) was used as the independent variables. According to the results, a 1% increase in the nominal exchange rate, a 0.11% increase in the domestic producer price index and 1% increase in world oil prices increase the producer price index by 0.07%. Similarly, a 1% increase in M3 money supply, a 0.28% increase in the producer price index and a 1% increase in the capacity utilization rate lead to a 0.31% increase in the producer price index. It is also understood that all variables in the model increase inflation. However, according to the findings, the long-term effects of the exchange rate effect on domestic prices remain low. In addition, the lowest transition effect on producer prices is attributable to crude oil prices. The other two variables, M3 and the capacity utilization rate, have a stronger effect on domestic prices than the exchange rate effect. The other two variables, M3 and the capacity utilization rate, have a stronger effect on domestic prices than the exchange rate effect.

I. Introduction

In a country that is open to capital and trade feel the effects of the developments in foreign countries on the local markets stronger. Therefore, the collapse of Breton Woods system and especially the liberalization of trade and capital movements in recent years have increased the studies on the effect of exchange rate system and exchange rate changes on local inflation in a country. The exchange rate can affect inflation because of the price of commercial goods and imported intermediate, capital goods and inflationary expectations. The effect of the change in the exchange rate, called reflection or pass-through, on local prices is particularly important for central banks, which are obliged to ensure price stability.

Exchange Rate Pass-through on Prices is defined as the effect of a one-unit change in the nominal exchange rate on import and export prices (Menon, 1996). In other words, a 1 percent change in the exchange rate pass-through between exchange and importing countries is the percentage change in the value of imported prices in national currencies (Goldberg & Knetter, 1996). Low pass-through, the effect of exchange rate changes on local prices, allows monetary policy to be more liberal in terms of facilitating price stability. Law of One Price and its extension, the purchasing power parity, is the basis of the pass-through studies. According to these theories, the prices of a product or a basket of products should be equivalent in two countries where trade is not hindered.

The pass-through effect from exchange rate to domestic prices can be imported through consumer goods, capital goods and imported input prices, or through domestic goods / services prices in foreign currencies. On the other hand, the increase in exchange rates may have an impact on inflation by increasing inflation expectations and wage demands. At this point, the current situation of the country in terms of inflation and its targets and whether the monetary authority follows a policy such as inflation targeting will be decisive for the level of intervention of the monetary authority in exchange rates. For example, the monetary authorities of inflation targeting in a country like Turkey will expect domestic prices to rise to control the level of exchange rates. Of course, the frequency and breadth of policies to suppress exchange rate increases are the country's export (growth) target, the level of foreign exchange reserves, the current account balance, money demand in the market, public investments / expenditures and budget balance, domestic / foreign debt level, interest (investment) policies. will vary depending on various macro balances such as national/global economic conjuncture. In this study, domestic producer prices in Turkey's economy with the nominal exchange rate, world crude oil prices, the domestic money supply and domestic income level (demand conditions) are examined representing the relationship between the industrial production indices.

In this study, the effect of the exchange rate on inflation in Turkey is examined. Studies related to the subject generally focus on the VAR model. This paper focuses on the ARDL model. Another specificity of this study is that it was conducted with the data of recent years.

2. Theoretical infrastructure of the pass-through effect between the exchange rate and inflation

The analysis of the relationship between the exchange rate and inflation focuses on the changes in the macroeconomic indicators caused by domestic and foreign market instability. That means that any shock or negativity in the other country's economy causes negative effects on domestic economic indicators in an open economy. Exchange rate, which is one of the two main macroeconomic indicators focusing on pass-through effect studies, represents foreign economic changes, while inflation represents the domestic economic situation. Therefore, any change in the exchange rate affects the domestic price level through various channels. In the literature, the pass-through effect is defined as passivity. Particularly developing countries' economies depend heavily on their imports, resulting in changes not only in consumer prices but also in production costs. According to Woo (1984), the relationship between the domestic price level and the exchange rate is explained in four different ways. These are;

- Imported input prices directly affecting domestic product costs
- Consumer goods imported and directly influenced the consumer price index
- The effect of the prices of products produced as a competitor to domestic imports from the increase in the prices of goods in foreign countries
- The effect of exchange rate changes on total demand through the current account and the transition to domestic prices

In light of this information, the pass-through effect cannot be mentioned in case the effect of the change in exchange rates cannot change the domestic prices. In addition, if the fluctuations in exchange rates reflect in the same way on one-to-one domestic sales prices, it is possible to mention the full pass-through effect. Similarly, if some of the fluctuations reflect in the domestic prices, we can mention the partial transition effect (Yang, 1997).

Especially, exchange rate activities may distress domestic prices through indirect and direct channels (can be seen from Chart 1). Under the direct channel assumption, exchange rate movements may affect internal prices through changes in imported input and imported goods prices (Hyder & Shah, 2004).

∗ Corresponding author. E-mail address: utkual@hotmail.com (U. Altunöz) (ORCID ID: 0000-0002-0232-3108)
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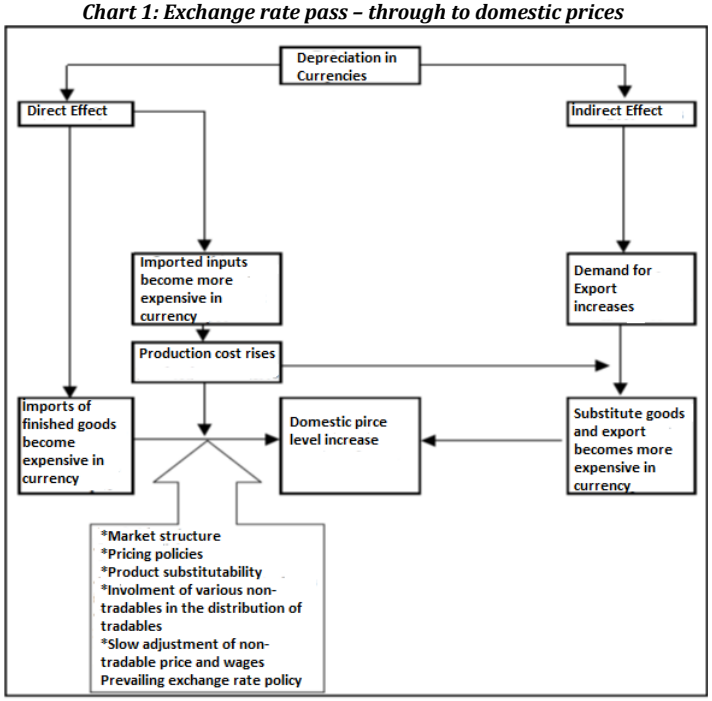
Chart 1: Exchange rate pass – through to domestic prices



Source: Hyder and Shah (2004)

In the case of direct channel, exchange rate movements may affect domestic prices with changes in imported finished goods and imported input prices. In general, when an exchange depreciation decreases, it will result in higher import prices, while lower import prices will result from the appreciation of the countries receiving the price. Potentially higher costs of imported raw materials and capital goods associated with the depreciation of the exchange rate increase marginal costs and cause the prices of domestic goods to rise. In the event of indirect effect, the exchange rate depreciation affects the net exports, which in turn influence the domestic prices with the change in aggregate demand, putting upward pressure on domestic prices. However, the extent and the speed of exchange rate pass-through depends on several factors such as pricing policies, general inflationary environment, the relative share of imports in WPI and CPI basket market structure, the involvement of non-tradable in the distribution of tradable, etc.

Some theories that explain this situation, which is known as the incomplete reflection (partial transition) of the exchange rate on prices. When these theories are analysed, different factors that determine the reflection effect between the exchange rate and prices vary according to periods and conditions. Burstein et al., (2003) claim that transportation costs arising during the domestic distribution and sale of imported goods, taxation and so on. domestic value-added reduces the impact of exchange rate changes on prices. Goldberg (2006) says that if the elasticity of the demand curve faced by exporters is high, the exchange rate will reduce the transition effect on prices.

3. Literature

Various vector auto-regression (VAR) methods are frequently used in the studies on the effect of exchange rate transition at the macroeconomic level. Taylor (2000) shown that low infection in many countries over the last few years may reduce firms' measured transit rate or pricing power. Hyder & Shah (2004) analysed assessing the extent to which exchange rate movements affect local wholesale and consumer prices in Pakistan by the VAR method. According to the findings of the study, exchange rate movements have a moderate effect on domestic market prices, and exchange rate pass-through effect is low. Arı (2010) claimed that the degree of transition effect can vary depending on many factors. Imported goods, increasing in the shares of consumer price index (CPI) and producer price index (PPI) in the inflation basket, pricing at overseas prices, product differentiation can increase the pass-through effect. Pass-through effect also decreases when firms can make market pricing and adjust profit margins and exchange rate volatility and demand elasticity increase. Kara & Öğünç (2012) investigated the effect of the exchange rate and import prices on consumer prices with the help of data obtained from 2002-2011 period using the VAR model. They found that the passivity was about 15 percent for both variables over a period of one year. In this study, the reasons for the decrease in the effect of the change in the exchange rates after 2001 are that the volatility in the nominal exchange rate is high and economic activity using imported inputs may shrink during the economic crisis. Sheefeni & Ocran (2014) examined the pass-through effect on Namibia for the periods between 1993 and 2011 by the VAR method. According to the results of the study, the effect of the exchange rates on inflation was significant and long-term. Alptekin at al.(2016) examined the exchange rate pass-through effect in the light of producer price index (PPI) and consumer price index (CPI) for Turkey. In the analysis for the 2005-2015 period, the effect of transition from the exchange rateto prices is calculated separately for CPI and PPI. According to the obtained results, the effect of the pass-through from the exchange rateto CPI tended to decrease. Currency CPI response to one-unit shock in the exchange rateis lower than the response to PPI. Kaygısız (2018) analysed the past-through effect of the exchange rate on inflation by VAR analysis over the 2002-2016 period in Turkey. According to the impact-response analysis, it was concluded that the response of inflation to the exchange rate ceased after 16 periods. In addition to the VAR methods, Özdamar (2015) examined the pass-through effect by ARDL method and reached the result that the long-term effect of the exchange rate on the domestic producer prices was low.

4. Empirical analysis of the pass-through effect in Turkey

In this study, which is based on the examination of the effect of the exchange rate on domestic prices at the macroeconomic level; Ito and Sato (2007), Carranza et al. (2009) and Özdamar (2015) found that the effect of the exchange rate depreciation on domestic prices (inflation) is investigated using control variables. In this study, the relationship between the various macro-economic factors and inflation in Turkey's economy are analysed using monthly data over the 2010: 01-2018: 12 period in the axis of changes. In this context, domestic producer price index (PPI) was used as the dependent variable and weighted nominal exchange rate (EXC), world crude oil prices (OIL), domestic money supply (M3) and the capacity utilization rate (CUR) were used as independent variables. All variables included in the analysis can be seen from Table 1 below.

Table 1: Symbols, Variables and Sources of the Analysis

Symbol	Variable	Source
PPI	Producer price index	Turkish Statistical Institute
EXC	Nominal weighted exchange rate	Central Bank of Turkey
OIL	World crude oil price	OPEC Annual Statistical
M3	M3	Central Bank of Turkey
CUR	Capacity utilization rate	Turkish Statistical Institute

In Table 1, world oil prices used as control variables represent supply shocks, the capacity utilization rate represents domestic demand (income) effect and M3 money supply represents monetary policy effect.
The basic model of the study is as in equation (1).

$$lnPPI_t = c_t + \alpha_1 lnEXC + \alpha_2 lnOIL_t + \alpha_3 lnM3_t + \alpha_4 lnCUR_t + \varepsilon_t \quad (1)$$

In equation (1) c, ε_t and ln respectively represent the constant term, error term and the natural logarithm. The calendar-adjusted the capacity utilization rate was seasonally adjusted using the TRAMO/SEATS method and included in the analysis.

4.1. Unit Root Tests

In the time series analysis, first, the stationary levels of the series should be determined. Spurious regression problem is encountered in the models estimated by non-stationary series. The trend characteristics of the series were examined before proceeding to the unit root tests and obtained results showed that all the series exhibited trend characteristics. For this reason, trend and constant model was chosen as the test equation in unit root tests. Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) Tests also is preferred to determine the stationary level of the time series. Dickey & Fuller (1981) formulates the ADF test as in equation (2), (3) and (4).

$$\Delta Y_t = PY_{t-1} + \sum_{i=1}^{k} \beta_i \Delta Y_{t-i} + \varepsilon_t \quad (2)$$

$$\Delta Y_t = \alpha + PY_{t-1} + \sum_{i=1}^{k} \beta_i \Delta Y_{t-1} + \varepsilon_t \quad (3)$$

$$\Delta Y_t = \alpha + \delta t + PY_{t-1} + \sum_{i=1}^{k} \beta_i \Delta Y_{t-1} + \varepsilon_t \quad (4)$$

In the equations (2), (3) and (4), ΔY_t represents the first difference of the variable subject to analysis. In addition, k is the lag length, t is the time trend, ΔY_{t-i} is the period delay difference and ε_t is the error term. In the ADF tests, two hypotheses as are constructed, and the null hypothesis claims that the series contains a unit-root. In the case of not rejecting the null hypothesis, it is possible to mention the existence of the unit roots.

Perron (1988) has developed a unit root model in which most of the time series cannot be characterized by unit root and the breaks are added to the model on the assumption that the time of important structural developments can be experienced. The regression equations of the ADF unit root test are used in the PP model as well. However, the auto correlation problem is eliminated and the result of the parameter of the previous term (δ) τ statistic is corrected.

Table 2**: **Results of Unit Root Test

Variables	*ADF (Constant and Trend)*	*PP (Constant and Trend)*
PPI	-3,87*	-4,11
ΔPPI	-	-8,19*
EXC	-3,17	-1,67*
ΔEXC	-7,18*	-
OIL	-2,87	-1,87*
ΔOIL	-8,19*	-9,01*
M3	-4,10*	-1.90*
ΔM3	-	-
CUR	-1,88	-2,30
ΔCUR	-9.76**	-8,81*

Note: Δ Denotes the first difference of the variables. The lag length the ADF test was determined automatically by the Schwarz information criterion (maximum 12 lag). * and **indicate that the series does not contain unit roots at 1% and 5% statistical significance levels, respectively.

According to unit root result seen from Table 1, the Autoregressive Distributed Lag (ARDL) Bound Test ARDL-bound test, which allows the investigation of the relationships between series with different stasis levels, is an appropriate method.

4. 2. Autoregressive Distributed Lag (ARDL) Bound Test

In case the stationary levels of the series are different, ARDL-Border test method developed by Pesaran & Shin (1995, 1999), Pesaran & Smith (1998) and Pesaran et al. (2001) is used because the ARDL approach allows the examination of the co-integration relationship when the explanatory variables are stationary at different levels such as level [I (0)] and first difference [I (1)]. As can be seen in the analysis section, it was determined that the variables in the empirical model were stationary at different levels, and decided that ARDL-Bound test method was an appropriate model for the study. The ARDL method is based on the standard least squares regression method, where the lagged values of both the dependent variable and the explanatory variable (s) are used as explanatory variables. The ARDL-Bound test equation which was established to determine the co-integration relationship between the variables in the model is as follows:

$$\Delta lnPPI_t = \alpha_0 + \sum_{i=1}^{m} \alpha_{1i} \Delta lnPPI_{t-i} + \sum_{i=0}^{n} \alpha_{2i} lnEXC_{t-i} + \sum_{i=0}^{p} \alpha_{3i} lnOIL_{t-i} + \sum_{i=0}^{r} \alpha_{4i} lnM3_{t-i} + \sum_{i=0}^{s} \alpha_{5i} lnCUR_{t-i} + \beta_1 lnPPI_{t-1} + \beta_2 lnEXC_{t-1} + \beta_3 lnOIL_{t-1} + \beta_4 lnM3_{t-1} + \beta_5 lnCUR_{t-1} + \varepsilon_t \quad (5)$$

The coefficients α in equation 5 show the short-term and β coefficients show the long-term dynamics. In order to ensure the stability conditions of the estimation, firstly the optimal lag length (m, n, p, r, s) of the variables in the equation 5 are determined with the help of information criteria and then the boundary test is carried out from the model estimated with the appropriate lag length. The equation (2) is estimated according to the lag lengths and F-statistic is calculated to test the validity of the null hypothesis ($H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$) that there is no co-integration relationship between the variables in the model.

In case the obtained F statistical value is less than the tabulated critical values in the works of Pesaran et al., it is concluded that there is no co-integration relationship between the series. Similarly, in case the F statistics reached above the upper critical value than the tabulated critical values in the works of Pesaran et al., there is a co-integration relationship between the series.

In the case that the test statistic lies within the lower and upper critical bounds, a conclusive inference can only be made if the order of integration of each regressor is known. In other words, if there is a value between the two values, no comments can be made (Altunöz, 2018). The obtained F-statistic results are shown in Table 3 below.

Table 3**: **F Statistic Result

Critical Value (%1)			
k	**F Statistic**	**lower bound**	**upper bound**
5	5,21	4,18	5,10
Diagnostic Tests			
$R^2 = 0{,}599$		Breusch-Godfrey LM(12)=16,111 Probability (0,31)	
$D - W\ ist. = 2{,}541$		White ist.=87,817 Probability (0,56)	
Fist.(Probability)=12,871(0,000)		Jarque Bera ist.=2.651 Probability (0,28)	

According to Table 3, because F statistical value is above the upper critical value, there is a co-integration relationship between the variables at %1 significant value. Furthermore, whether the model is an autocorrelation problem or not, variance and distribution of error term were investigated with diagnostic tests. As a result, it was determined that there was no autocorrelation and heteroscedasticity problem in the model established for the boundary test, and the error term had a normal distribution.

Having determined the existence of co-integration relationship among variables, long and short-term relationships will be tested by ARDL method.

In this study, the ARDL model to be estimated to investigate the long-term relationship among the variables is as in equation 6 below:

$$\Delta lnPPI_t = \alpha_0 + \sum_{i=1}^{m} \alpha_{1i} \Delta lnPPI_{t-i} + \sum_{i=0}^{n} \alpha_{2i} lnEXC_{t-i} + \sum_{i=0}^{p} \alpha_{3i} lnOIL_{t-i} + \sum_{i=0}^{r} \alpha_{4i} lnM3_{t-i} + \sum_{i=0}^{s} \alpha_{5i} lnCUR_{t-i} + \varepsilon_t \quad (6)$$

To determine the long-term relationship among variables, the equation (6) will be estimated with the ARDL (4,3,2,1,0) model according to the appropriate lag lengths determined for the variables. Results can be seen in Table 4 below.

Table 4**: **Estimation Results of the ARDL (4, 3, 2, 1, 0) Long Term Model

Variables	**coefficent**	**Std. Dev.**	**t stat.**	**Probability**
constant	-0.389	0.167	-1.901	0.000
$lnPPI(-1)$	1.011	0.056	9.110	0.000
$lnPPI(-2)$	-0.071	0.109	-0.421	0.312
$lnPPI(-3)$	-0.148	0.031	-2.412	0.012
$lnPPI(-4)$	-0.116	0.011	-2.910	0.011
$lnEXC$	0.161	0.010	6.718	0.001
$lnEXC(-1)$	-0.121	0.012	-3.111	0.010
$lnEXC(-2)$	-0.061	0.021	-1.278	0.001
$\ln EXC(-3)$	0.051	0.021	3.178	0.018
$lnOIL$	0.071	0.004	-3.167	0.001
$lnOIL(-1)$	-0.011	0.001	-2.901	0.003
$lnOIL(-2)$	-0.010	0.056	-2.670	0.003
$lnM3$	-0.061	0.006	3.213	0.005
$lnM3(-1)$	-0.044	0.012	4.412	0.004
$lnCUR$	0.011	0.010	2.415	0.000
R^2: 0.96		$F\ Stat$: 2718(0.00)		$D.W$: 2.90

Following the Estimation Results of the ARDL (4,3,2,1,0) long term Model, Long-term estimation results calculated using ARDL (3,3,1,1,0) model are presented in Table 5.

Table 5**: **coefficients of the ARDL (4, 3, 2, 1, 0) Long Term

Variables	**coefficient**	**Std. Dev.**	**t stat.**	**Probability**
$lnEXC$	0.11	0.061	1.90	0.000
$lnOIL$	0.07	0.010	3.09	0.006
$lnM3$	0.28	0.021	6.19	0.016
$lnCUR$	0.31	0.081	1.99	0.000

According to Table 5, a 1% increase in the nominal exchange rate caused a 0.11% increase in domestic producer price index, while a 1% increase in world oil prices increased the producer price index by 0.07%. Similarly, a 1% increase in the money supply caused a 0.28% increase in the producer price index and a 1% increase in the capacity utilization rate led to a 0.31% increase in the producer price index. All of the coefficients were statistically significant, and the signs of the coefficients were consistent with the economic expectation. it is also understood that all variables included in the model increase inflation. Diagnostic tests have been performed for ARDL (4,3,2,1,0) model and can be seen in Table 6.

Table 6: Diagnostic Test Results of Long − Term Relationship

Diagnostic Test	Test Statistic	Probability
Jarque − Bera Test	2.81**	0.16
Ramsey Reset Test (4)	0.331*	0.61
Breusch − Godfrey LM Test (10)	12.151*	0.18
White Test	58.17**	0.10

Note: *and ** indicate the significance level of 1% and 5%, respectively.

It is understood that in the model, there is no autocorrelation according to Breusch-Godfrey LM [with 10 lag] test, and there is no variance problem according to White test, the error term had normal distribution according to Jarque-Bera test and there is also no error of model building according to Ramsey Reset [with 2 added terms] test. The short-term relationship between the variables is examined with the error correction model based on the ARDL method. This model is as follows in equation (6):

$$\Delta lnPPI_t = \alpha_0 + \sum_{i=1}^{m} \alpha_{1i} \Delta lnPPI_{t-i} + \sum_{i=0}^{n} \alpha_{2i} lnEXC_{t-i} + \sum_{i=0}^{p} \alpha_{3i} lnOIL_{t-i} + \sum_{i=0}^{r} \alpha_{4i} lnM3_{t-i} + \sum_{i=0}^{s} \alpha_{5i} lnCUR_{t-i} + \varphi ECT_{t-1} + \varepsilon_t \quad (6)$$

ECT variable in the equation is the error correction term. The coefficient (φ) of this variable shows how soon it is possible to correct a short-term imbalance between dependent and explanatory variables in the model.

For the error correction mechanism, the coefficient of this variable is expected to be negative and statistically significant.

Table 7: ARDL (4,3,2,1,0) Error Correction Model Estimation Results

Variables	coefficent	Std. Dev.	t stat.	Probability
constant	-0.312	0.054	-3.809	0.000
$\Delta lnPPI(-1)$	0.181	0.067	2.901	0.000
$\Delta lnPPI(-2)$	0.141	0.09	2.121	0.024
$\Delta lnPPI(-3)$	0.148	0.008	2.412	0.034
$\Delta lnEXC$	0.120	0.016	5.811	0.007
$\Delta lnEXC(-1)$	-0.041	0.011	0.111	0.310
$lnEXC(-2)$	-0.063	0.034	-1.667	0.001
$\Delta lnOIL$	0.031	0.009	6.167	0.001
$\Delta lnOIL(-1)$	0.017	0.001	2.667	0.000
$\Delta lnM3$	-0.082	0.006	1.411	0.002
$\Delta lnCUR$	0.005	0.091	2.415	0.034
$ECT(-1)$	-0.251	0.071	-3.617	0.000

The results of the error correction model based on the ARDL (4,3,2,1,0) model are presented in Table 7. When the table is examined, it is understood that the coefficients in the model are mostly statistically significant. On the other hand, error correction term (ECTt-1) coefficient is negative as expected and statistically significant. Accordingly, 25% of the deviations from the long-term equilibrium due to short-term shocks will be corrected in the next period and the effect of shocks will be eliminated within 4 terms and the long-term equilibrium will be approached.

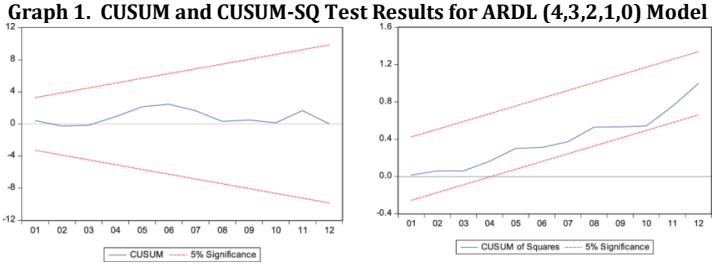
Table 8: Diagnostic Test Results of Short − Term Relationship

Diagnostic Test	Test Statistic	Probability
Jarque − Bera Test	2.94**	0.12
Ramsey Reset Test (4)	0.761*	0.39
Breusch − Godfrey LM Test (10)	17151*	0.11
White Test	77.17**	0.18

The short-term diagnostic tests followed in Table 8 also show that the stability conditions of the model are met. According to Laidler (1993), some of the instability problems may arise from under-modelling of short-term dynamics that characterize separation from long-term relationships.

Therefore, short-term dynamics should be considered in testing the stability of long-term parameters. Therefore, the stability of the long-term coefficients used to obtain the error correction term for short-term dynamics should be measured. In this context, Brown et al. (1975) recommended by CUSUM and CUSUMQ tests are used. The results obtained from the CUSUM and CUSUMQ tests are shown in Graph 12.

Graph 1. CUSUM and CUSUM-SQ Test Results for ARDL (4,3,2,1,0) Model



According to the aforementioned graphs, CUSUM and CUSUM-SQ statistics are within the critical limits of 5% significance level, it is understood that the long-term parameters calculated by the ARDL method and the residual variance of the model are stable and that the model can be estimated without using artificial variables due to the absence of structural changes.

5. Conclusion

In this study, the effect of the exchange rate on inflation in Turkey over the 2010-2018 period. For this purpose, the consumer price index was used as dependent variable and exchange rate, crude oil, the M3 money supply and capacity utilization ratio were included as independent variables. Boundary test showed a long-term relationship between variables.

According to the estimation results made by ARDL method, Capacity utilization rate and money supply have a relatively high and statistically significant effect on the domestic producer price inflation in the long run. World oil prices also had a statistically significant but low impact on domestic producer prices. Nominal exchange rates, on the other hand, have a statistically significant effect on producer price inflation in the long run, but have a relatively limited effect compared to the money supply and capacity utilization ratio.

Results mean that a 1% increase in the nominal exchange rate caused a 0.11% increase in domestic producer price index, while 1% increase in world oil prices increased the producer price index by 0.07%. Similarly, a 1% increase in the M3 money supply caused a 0.28% increase in the producer price index and a 1% increase in the capacity utilization rate led to a 0.31% increase in the producer price index. In the light of the result, economy and money management keep money supply under control, which is the main determinant of inflation in the long run. On the other hand, it is significant that the monetary authority, whose main purpose is to maintain price stability, focuses on exchange rate fluctuations and acts to limit exchange rate fluctuations as another major factor affecting inflation in both short and long term. In this context, if the interest rates are lowered by the Central Bank as a current topic of discussion, it can be considered that the shocks in the exchange rate will create serious pressure on domestic prices, especially in the short term.

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Utku ALTUNÖZ, 1979 Sinop Doğumludur. İlk orta ve lise öğrenimini Sinop'ta tamamlamıştır. Uluslararası Bankacılık ve Finans alanını Bireysel Emeklilik Sistemi ve makroekonomik etkileri adlı çalışması ile tamamlayan Altunöz, Finansal Krizler konusunda yapmış olduğu doktora tezi ile İstanbul Üniversitesi'nden doktor unvanını almıştır. Mesleki hayatına İşbankasında başlayan Altunöz, Groupama şirketinde 2 yıl MT, Finansbank'ta Bireysel Krediler Tahsis uzman yardımcısı (1 yıl) ve Uzmanı (2 yıl), Yapı Kredi Bankasında Ticari krediler Tahsis Uzmanı (2 Yıl) ve son olarak Genpower firmasında finans direktörü olarak çalışmıştır. 2013 Yılında Akademik kariyerine Sinop üniversitesi Boyabat İktisadi ve İdari Bilimler Fakültesi'nde Yardımcı doçent olarak başlayan Altunöz, 2015 yılında ekonomi doçenti unvanını almıştır. Aynı zamanda Para&Borsa Portalında ekonomi ve finans yazarı olan Altunöz'ün hakemli dergilerde yayımlanmış birçok ulusal ve Uluslar arası bilimsel makalesi, Ulusal ve Uluslar arası bilimsel kongrelerde sunulmuş tebliği bulunmaktadır Finansal Krizler, Erken Uyarı Sistemleri ve 2008 Krizi içi TR-ABD Örneği ve neoklasik İktisadın Eleştirisi: Post Otistik iktisat isimli iki kitabı olan Altunöz'ün İlgi alanları Makro ekonomi, Para politikaları, Para ve Sermaye Piyasaları ve Davranışsal İktisattır. Altunöz, Avrasya Ekonomistleri Derneği, İktisatçılar Cemiyeti, The National Bureau of Economic Research, American Economic Association ve World Economic Association üyesidir.

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Key Elements of Corporate Reputation

[a]Vildan Esenyel
[a]Girne American University, Faculty of Business & Economics, North Cyprus

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ABSTRACT

In the relevant literature, the concepts of corporate identity, corporate culture, and corporate image are explained in order to explain corporate reputation. However, there are important differences between them. Sometimes these concepts replace each other. Although all of these concepts are related to how organizations are perceived, there are differences between them. In the light of the explanations above, the theoretical dimensions of corporate identity, corporate culture, corporate image and their relations with the corporate reputation are examined in order to determine and explain the theoretical framework of corporate reputation.

1.Introduction

Since corporate reputation is an extremely complex issue, the issue in this field has not been clarified yet (Bankins & Waterhouse, 2019; Davies et al., 2001). Although it has been widely studied in various disciplines within the framework of various topics, there is no standard agreement on precisely what it means (De Castro et al., 2006) and what issues should be included in the literature, so no clear identification can be made (Mahon, 2002). One reason for this is that the content of the concept does not reveal the relationship between the other concepts, (Tucker & Melewar, 2005) and as a result, there is no definition so that everyone van have a joint decision on the subject (Barnett et al., 2006). Corporate reputation is recognized as a concept at the intersection of marketing and management. In order to define the corporate reputation, it is necessary to know the concepts in which the corporate reputation interacts. Identifying the relationship and the differences between these concepts, which are listed with the concept of corporate reputation, is vital in terms of clearly defining the basis on which the research is based. The concepts of corporate image, corporate identity, and corporate culture are the concepts most frequently confused with corporate reputation (Wartick, 2002).

2. Corporate reputation

Corporate reputation is a valuable strategic asset that enables organizations to differentiate from other organizations in the sector. Hence, corporate reputation is the emotions and reactions of the enterprises formed in society by considering their past and present activities (Fombrun, 1995). This jurisdiction, which is formed about the organization in the society, is different for each organization. Therefore, it creates a difference according to other enterprises and cannot be easily bought or sold quickly (Capraro & Srivastava, 1997). Although the management of corporate reputation is not a recent idea, the concept of reputation in terms of competition continues to gain importance for companies day by day, especially in the strategic management field (Fombrun, Ponzi & Newburry, 2015).

Reputation is defined by many disciplines and has been the subject of many research. However, reputation can be conceptualized as the perception and interpretation of the observers in the most general sense, it still presents conceptual limitation problems, and this results in a variety of definitions, some of which contradict each other (Clark & Montgomery,1998). To make a clear definition of the concept of corporate reputation has been quite difficult by academics as it is a concept based on the opinions of stakeholders and their expectations for performance and different definitions can be made from different perspectives. Researchers have argued that corporate reputation is abstract and can easily change over time, and therefore it is a sensitive resource (Hall, 1993). This resource is related to the stability of an organization and is a strategic resource that can easily change and be affected by various investments (Fombrun & Shanley,1990).

Corporate reputation is a concept that concerns many different disciplines. Each discipline first approaches the issue from its point of view, and therefore different definitions and conceptualizations emerge. Various corporate reputation definitions have been made by different researchers in various disciplines such as psychology, sociology, economics, management, and marketing. In each discipline, different meanings of corporate reputation can be loaded and defined in different ways, which display that it is a concept with notable multidisciplinary affluence (Fombrun & Van Riel, 1997).

Table 1: Evaluation of corporate reputation concept according to different disciplines

Research perspective	Focus	Related Researchers
Financial	Reputation is one of the abstract assets that are difficult to measure but create value for the company.	Roberts & Dowling (2002);Helm (2007); Grossman & Stiglitz (1980); Lahno (1995)
Sociology	Reputation assessments are social structures that arise from the relationships that the firm establishes in the corporate environment shared with its stakeholders.	Rindova, Williamson, Petkova & Sever (2005)
Marketing	Reputation is the corporate connotations that individuals match with the firm's name.	Nguyen & Leblanc (2001); Dawar & Parker (1994)
Corporate Communication	Reputation is the institutional characteristics arising from the relationships that the company has established with many elements.	Alessandri (2001); Alvesson, (1998);Balmer & Wilson, (1998);Gotsi &Wilson (2001b)
Public relations	Corporate reputation management is often treated as a practice and object of public relations.	Hutton, Goodman, Alexander & Genest (2001)
Other studies	Corporate reputation is researched by game and signalling theorists. The game theorists treat corporate reputation as a company's traits that signify one's possible behaviour and actions towards stakeholders. Thus, economists consider corporate reputation as a signal about a company's presumable actions in the market and its possible strategic behaviour in the marketplace	Davies et al. (2001); Fombrun & Van Riel (1997)

Source: The author's own preparation

∗ Corresponding author. E-mail address: vildanesenyel@gau.edu.tr (V. Esenyel).
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Table 1 shows the concept of reputation in different disciplines. The evaluation of corporate reputation within each discipline can also be said to influence the choice of tools for the development of corporate reputation and the management of the process (Fombrun, 1995).

There are also some opinions about corporate reputation in the field of human resources management. However, although employees are accepted as envoys of corporate reputation (Gotsi & Wilson, 2001a), little attention is paid to the role and potential of employees. Most organizations focus more on external stakeholders, (mostly on the perceptions of customers) mostly ignoring the fact that employees are one of the largest and most important stakeholder groups (Alsop, 2004; Gotsi & Wilson, 2001b).

3. Corporate image

In contrast to reputation, corporate image is often related to symbols and values (Andreassen & Lindestad, 1998). Corporate image is the result of a process, and this process consists of thoughts, feelings, and past experiences into a perception of the institution (Gotsi & Wilson, 2001a). The correct perception of the corporate image both inside and outside the organization depends on the effectiveness of the managers. The representation and the professionalism of the administrators of the institution are of great importance for the positive or negative perception of the institution's image (Dichter, 1985; Yuille & Catchpole, 1977).

According to Charles J. Fombrun, Head of the Reputation Institute and Director of Management Consultancy Program at Stern School of Business, New York University; a company has many images, but only one has its reputation and that this reputation is a net evaluation of all images of the organization for a wide range of social stakeholders (Fombrun, 1995). Reputation is defined as a set of personal and collective judgments about a company or industry's reliability, trustworthiness, responsibility, and competence-based on a broad set of values (Barnett et al., 2006). Because corporate reputation combines many images that people have in their minds about the institution, they are moved to the status and prestige of the institution (Hanson & Stuart, 2001). In this sense, corporate reputation consists of the opinions of all target groups about the institution, and the image consists of the individual's personal opinions (Gardberg, 2017).

Corporate reputation is evaluated within the framework of the firm's record. A firm's stance in the market and society shapes its reputation (Bromley, 2000). Although corporate image can be created in a short time by using various techniques, corporate reputation can only be gained as a result of long-term efforts of the company (Chun, 2005).

The most fundamental difference between corporate reputation and corporate image can be expressed as the impact of image on the face of intense public relations activities, although the reputation is the result of a long period and intensive efforts (Lin & Lu, 2010). Corporate reputation occurs over time as a result of consistent performance. The image can be formatted much more quickly through well-designed communication programs (Bankins & Waterhouse, 2019). Corporate reputation is defined as a perceptual representation of past actions and future expectations, which explain the company's overall appeal to all its key stakeholders as compared to other competitors (Fombrun & Van Riel, 1997). This definition underlines that corporate reputation reveals the differences between the firms. The corporate image is composed of individual thoughts; Reputation is a concept that embraces higher value judgments covering all segments of society. So the next step after the formation of the image is the formation of reputation (Nguyen & Leblanc, 2001).

4. Corporate identity

When the corporate identity is mentioned, the first things that come to the mind of many people are the visual elements such as the logo of the organization, the colours, and emblem it uses (Balmer & Wilson, 1998). However, this is inadequate in explaining the identity of the organization because the corporate identity consists of corporate design, which encompasses the visual elements mentioned above; the use of these elements in an organization (Albert & Whetten, 1985).

Corporate identity, in its most general definition, is the sum of the feelings and thoughts that an organization's employees feel for their institution (Dutton & Dukerich, 1991). It is assumed that identity is a concept where individual values and characteristics of an institution are gathered in everyday thought.

According to Albert and Whetten (1985), corporate identity represents the fundamental, permanent and most distinctive characteristics of an organization (Jo Hatch & Schultz, 1997).

The success of a corporate identity program should be considered as one of the most important businesses of enterprises (Bromley, 2000). The corporate identity is how the organization sees itself and how its environment perceives it (Ashforth & Mael, 1989). The corporate identity consists of elements such as communication with the environment of the institution, management approach, and behaviour of employees in the institution (Jo Hatch & Schultz, 1997).

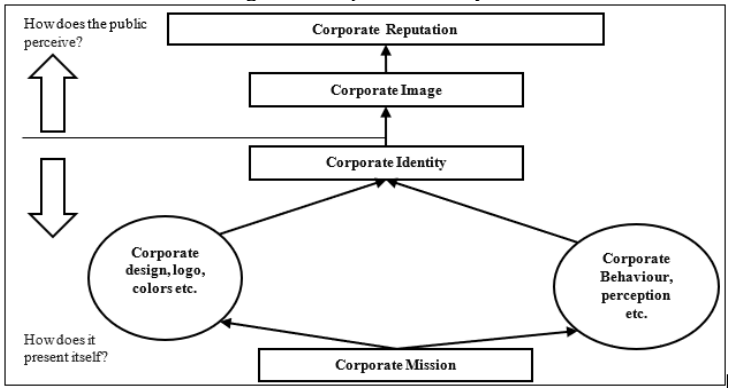
According to Bankins and Waterhouse (2019), the main reasons why institutions need an identity are to ensure the integration of employees with the institution and to make a difference between them with their competitors. The reason why institutions want to be different from their competitors is to determine the identity of the organization since the institutions produce products close to each other.

Improvement of the working environment; gaining importance of trust and ethical values; the development of a participatory management approach will play a critical role in building and motivating a positive impact on people. Its impact on corporate reputation can explain the role of corporate identity in human resources. The researches show that corporate identity and corporate reputation also affect the employees (Bankins & Waterhouse, 2019).

The definition of self-esteem by the institution that the employees work with plays an important role in adopting the fundamental values of the institution, adapting its behavior and building the reputation of the institution (Gotsi & Wilson, 2001a). Therefore, it can be said that the source of corporate reputation is related to the corporate identity that expresses the whole of how an organization represents itself. The importance of employees can explain another dimension of corporate identity. Because as long as the employees feel valued as part of the organization, the identity of the organization gains meaning (Helm, 2011).

Employees involved in the formation of the corporate identity should also be able to live the pride of being a part of that identity. The image and reputation of a workforce that prides itself on the institution will undoubtedly be positive. Therefore, it can be said that corporate identity is a tool that motivates workers. On the other hand, it has a composite structure which has a role as an integrator and has a supportive effect on supporting corporate reputation (Weigelt & Camerer, 1998). Identity perceived by human beings covers the whole activity that determines how the institution will be perceived as representing itself. Accordingly, as a characteristic element, corporate identity affects the affected parties positively or negatively (Dutton & Dukerich, 1991). Figure 1 shows that corporate identity is shaped as a result of the elements supporting the mission of the organization.

Figure 1. Corporate identity model



Source: Westcott Alessandri, 2001

The elements that constitute the source of the corporate identity are used to reveal the values accepted according to the corporate philosophy. Therefore, the primary purpose of the establishment of corporate identity is to provide a holistic approach within the enterprise as well as to form the basic expectation to shape the corporate image and to achieve a corporate reputation as the ultimate goal (Collins & Stevens, 2001). In the light of the above statements, it is seen that the corporate identity is the primary source of the corporate reputation reputation in the creation of the desired corporate image in order to create dignity by the stakeholders and ultimately complement each other to achieve desired goals.

5. Corporate culture

Another issue that stands out in determining the institutional reputation of the the corporate reputation can be explained by the corporate culture (Fombrun & Van Riel, 1997). Considering corporate culture as a component of corporate reputation can be explained by inter-concept interaction and complementary

elements (Barney, 1986). Corporate identity and corporate culture have a structure that affects each other (Hall, 1993). For this reason, corporate culture should be considered as a component that constitutes the source of corporate reputation.

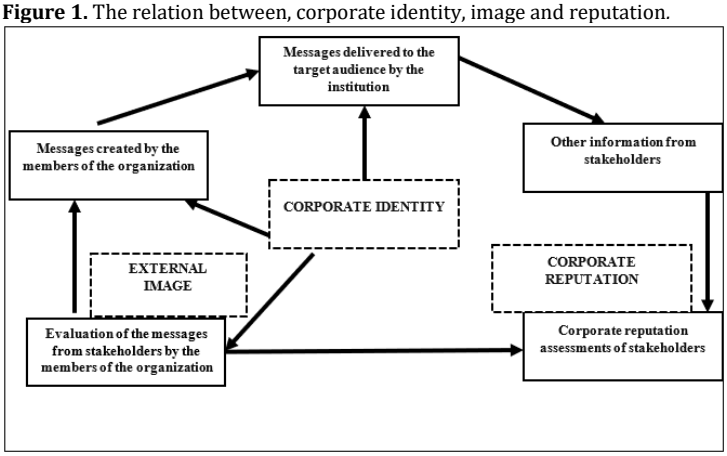
As in the concept of culture, corporate culture is one of the most challenging concepts to define (Flatt & Kowalczyk, 2008). Corporate culture is a set of meanings that distinguishes it from other organizations and is shared by the members of the organization. Corporate culture is an independent area that influences the corporate identity along with the image (Chun, 2005). However, it would be useful to evaluate these concepts which are closely related to each other with a holistic view. This is because the norm and system of corporate culture constitute the basis for corporate identity (Nacinovic, Galetic & Cavlek, 2009). In creating a positive image environment, there must be a corporate culture in which the desired messages are presented. The corporate culture in terms of reputation literature is important since reputation is achieved in time and with internalization through corporate culture (Alsop, 2004). It is possible to say that as long as corporate reputation cannot be transformed as a part of corporate culture and employees are not considered as carriers of corporate reputation, reputation formation and development cannot be based on a reasonable basis (Clive, 1997). Therefore, corporate culture as the subject related to corporate reputation is considered as the reference point that constitutes the source of the corporate reputation (Işık et al., 2019).

To summarize the section up to now, the reputation and image term can be called as the perception of the institution by the stakeholders. Image refers to the ideas of the stakeholders regarding the institution, identity is about what the institution thinks of itself, and personality is about what the institution is. The cooperation of these concepts is a crucial point for an organization to create, develop and maintain its reputation. This is where reputation management becomes critical. All components of reputation must be managed in a coherent and coordinated manner. Otherwise, it is impossible to obtain a positive reputation and benefit from the benefits of a positive reputation. According to Roberts and Dowling (2002), the leadership style of senior management and the vision shared with the employees affect the corporate reputation perception of employees through the policies and procedures within that institution. However, the culture, identity, and values of the organization are combined with the experiences of the employees and constitute a perception about the reputation of the institution. Besides, employees will be informed about the recognition of the external environment of the organization such as media, competitors and sector, will be aware of the image created on the external environment and thus this awareness will affect the perceptions of the company (Bankins & Waterhouse, 2019).

Corporate identity is an outcome of the culture within the institution and is fed by cultural values. Identity provides for the emergence of symbols in the creation of the image. In other words, the image is an output of corporate identity, while internal factors nourish the corporate identity while the image is its projected face (Nacinovic, Galetic & Cavlek, 2009). By Chun (2005), the concept of corporate reputation is likened to an umbrella that includes corporate image and corporate identity. Corporate reputation is defined as a concept in which the organization is actually (its real identity), how it promotes itself (the identity desired by the institution), and where the consumers' thoughts about the institution (corporate image) come together in the common denominator (Gray & Balmer, 1998). Moreover, the positive reputation that can be achieved in the target masses requires more than practical communication efforts, which is a valuable process shaped in line with the regular communication and marketing activities that have been shown over the years. At this point, the regular communication program strengthens a positive reputation and increases its value in the institutional sense (Gray & Balmer, 1998). In Figure 2, Hatch and Schultz (2002) explained the relationship between corporate image and corporate reputation with the concept of corporate identity.

Figure 2 illustrates the relationship between corporate reputation, corporate identity, and external image. Corporate identity is evaluated as the perceptions of internal stakeholders about the institution. Corporate identity, corporate reputation, and external image have a substantial difference and relationship. Corporate identity, from the perceptions of the employees of the organization, the corporate image (external image) is the impressions and thoughts of the external stakeholders about the institution. Corporate reputation represents a holistic structure that is composed of both employees within the organization and perceptions of stakeholders outside the organization. In the context of the process, it can be said that corporate identity affects the corporate image and shapes the corporate reputation in the long term. In this context, corporate reputation is a collective concept that

Figure 1. The relation between, corporate identity, image and reputation.

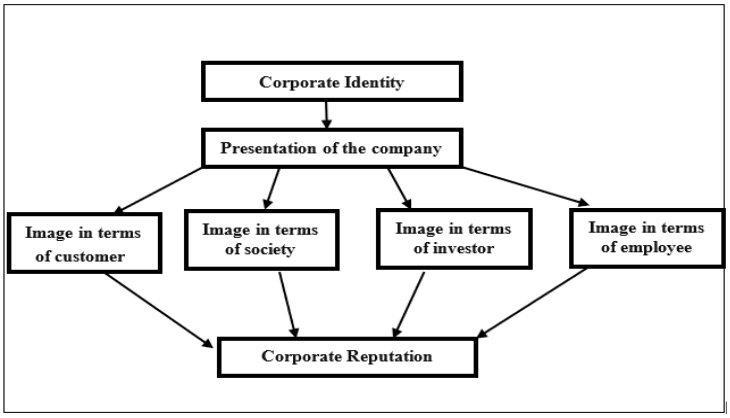


Source: Hatch & Schultz, 2002

includes both corporate identity and corporate image. Based on all the definitions and expressions made concerning the subject, the remarkable point is that the creation of a corporate image is a stage of the creation process of a valuable reputation. A sharp image can be achieved through a regular communication campaign that includes an appropriate communication system.

Another issue that emerged in the literature about the corporate image can be explained by the binding role between corporate identity and corporate reputation. In the following way, Fombrun (1995) clarifies the two dimensions of the corporate image.

Figure 3. Identity-image-reputation model



Source: Fombrun, 1995

The first dimension that emerged in the model expressed in Figure 3 can be explained with the effect of corporate image on corporate reputation. A second dimension is the role of corporate image on the transfer of corporate identity in the formation of corporate reputation. Having the corporate image in the mind of every denominator is due to the difference of expectations of each denominator. This situation creates different kinds of images (product image, brand image, transfer image) for the stakeholders, in the end, a kind of top image which represents an attitude and expression of an institution (Işık & Aydın, 2016; Gray & Balmer, 1998). This image describes the nature of the entire business. In other words, the whole image reflects the sum of the corporate reputation value.
Fombrun (1995) presents a second issue in the model that the presented images images need to be consistent with identity. Therefore, corporate identity and corporate image must be consistent and must complement each other. The corporate image also offers an orientation on how to reflect the corporate identity in the acquisition of corporate reputation. Therefore, the role of the corporate image in corporate reputation literature can be explained with the relationship between corporate identity and corporate reputation. The identity of the institution reveals the distinguishing features of the institution and the image constitutes the source of the corporate reputation in the ultimate sense by creating different aspects of the institution.

6. Conclusion

The most critical issue that distinguishes corporate reputation from others is

that it takes quite a long time to develop and reflects a standard view of stakeholders at both levels, both inside and outside the organization (Bromley, 2000; Chun, 2005; Gotsi & Wilson, 2001a). There are two primary components of reputation. These are perception and reality. While perception relates to how its stakeholders see the organization, reality relates to the organization's policies, practices, procedures, and performance (Deephouse & Carter, 2005). The explanations, as mentioned above, focus on the perception of the enterprise by the external stakeholders, both corporate image and corporate reputation, so in that framework, the three concepts are strongly related with each other, and thus the institutions are obliged to monitor the perceptions of the stakeholders (Bromley, 2000).

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Vildan Esenyel is a lecturer in the Department of Business Management at Girne American University, North Cyprus. She graduated from the Ege University, Faculty of Letters, Turkey, 2002. She defended her master's thesis in Educational Leadership and School Improvement in the Faculty of Humanities, Manchester University, England, in 2007. She defended her doctoral dissertation in 2019 and received her Ph.D. in Business Management from Girne American University, Faculty of Business and Economics. Her research interest includes strategic management, entrepreneurship, brand management, and leadership. Her researches have been presented at conferences. Her recent publication is "The relationship between perceived corporate reputation and employee's positive word of mouth behavior: The mediation effect of trust to managers."

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Assessing the Short-term Impacts of COVID-19 Pandemic on Foreign Visitor's Demand for Turkey: A Scenario Analysis

[a]Fatih Günay, [b]Engin Bayraktaroğlu, [c]Kahraman Özkul
[a]*Mersin University, Department of Tourism Management, Mersin – Turkey, [b] Anadolu University, Department of Tourism Management, Eskişehir – Turkey, [c]Mavi Deniz Publication, Rize - Turkey

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ABSTRACT

Since it first started in China, COVID-19 outbreak has become the number one problem of the World. World Health Organization accepted COVID-19 outbreak a pandemic on March 11, 2020. In light of the latest information, it could be said that the world has never encountered such a pandemic in the last century. Tourism is one of the most sensitive sectors to crises such as wars, terrorist attacks, natural disasters and other kinds of unexpected phenomena. This study aims to forecast the short-term effects of COVID-19 pandemic on foreign visitors' demand for Turkey by using scenario analysis technique. According to the results, a decline in foreign visitors' arrivals in the range of 5% to 53% is estimated. It means a loss of tourism revenues about $15.2 billion as the worst, and $1.5 billion as the best alternative scenario for 2020. It is essential to develop recovery plans and to implement them urgently, to minimize the harms of the COVID-19 pandemic on Turkish tourism.

1. Introduction

Since it first started in China, the World has been under the effect of COVID-19 outbreak. World Health Organization classified COVID-19 outbreak as a pandemic on March 11, 2020. Because of COVID-19 and precautionary measures taken to curb the spread, economic conditions have become uncertain, specifically for the tourism industry.

In light of the latest information, it could be said that the world has never encountered such a pandemic in the last century. In the modern era, tourism activities and international mobility have reached a global scale. But in the third month following the first reported case, many countries restricted international mobility as a preventive measure against the virus. Some countries closed their borders entirely and others restricted border crossings. On the other hand, countries warned their citizens not to travel unless it is necessary. By taking these measures and defensive actions to stop the spreading of the virus, international mobility has almost stopped in the world and tourism activities have been delayed.

Tourism is one of the most sensitive sectors to crises such as wars, terrorist attacks, natural disasters and other kinds of unwanted phenomena. Normally, tourism demand and forecasts could be done by some objective methods, but coronavirus pandemic has changed all the circumstances and affected all the conditions in the economic cycle.

At this point, forecasting tourist demand with subjective or hypothetical methods could be seen as a solution. This study aims to forecast the short-term effects of COVID-19 pandemic on foreign visitors' demand for Turkey by using scenario analysis technique. For this purpose, the paper has designed in five sections. After the introduction, a literature review was conducted on the current state of international tourism, the past pandemics and the international tourism demand for Turkey. In the methodology section, short-term effects of COVID-19 pandemic on foreign visitors' demand for Turkey was analysed by using scenario analysis technique and some suggestions were made in the conclusion section. This study could be seen as an early prediction related to the effects of COVID-19 pandemic on tourist mobility to Turkey. It has seen in the results that, decision-makers still have time to recover the effects of the pandemic in 2020.

2. Literature Review

2.1. Chronological Spread of COVID-19 and Preventive Measures

COVID-19, known also as the Coronavirus, appeared in December 2019, according to the information provided by the World Health Organization (WHO). On January 9, 2020, a 61-year-old person in China was found to have similar symptoms with the SARS virus. On January 11, 2020, the first case was confirmed and announced by the Wuhan Municipal Health Commission ("China reports first dead," 2020). On January 20, 2020, the virus was detected on a US citizen returning from his trip in Wuhan, and he was quarantined. This I s the first reported case in the USA (Nedelman, 2020). On January 20, 2020, more than 200 people were reported to have symptoms of the pandemic. Until that date, 3 people had been infected, and the virus was also seen in Shanghai and Shenzhen cities of China ("New China Virus," 2020). The first case in South Korea was also confirmed on 20th January ("New Virus Surging," 2020).

On January 22, 2020, the first travel restriction came due to the coronavirus by North Korea. It was stated by the North Korean administration that there was a restriction for the tourists who wanted to travel the country entering via China and that such a decision was made due to the epidemic that started in Wuhan ("North Korea Bans Foreign Tourists," 2020). On January 24, 2020, China started to apply travel restrictions in 13 cities in which 35 million people lived, to prevent the spread of the virus. Thus, another major travel restriction was introduced by China after North Korea's restrictions on tourists entering the country ("China Expands Virus Lockdown," 2020). On the same day, 3 cases were confirmed in France. These cases were the first ones confirmed in the European Union ("Coronavirus Reaches Europe," 2020).

With the spreading of COVID-19 virus, countries geographically close to China took several preventive safety measures against the outbreak. These preventive measures, which started with the screening of passengers from China at the airports with thermal cameras, passed to the next stage with the flight cancellations decisions made by several countries on January 25. Russia warned its citizens not to travel to China and cancelled all flights from Wuhan to Moscow. Tajikistan cancelled Somor Air's all flights from Tajikistan to China and all flights of South Airlines from China to Tajikistan ("Airlines Suspend Flights," 2020). On January 27, 2020, Turkey urged its citizens not to travel to China unless necessary (Zorlu, 2020). In late January, many airlines decided to cancel their flights to China ("Airlines Suspend Flights," 2020). Germany reported its first coronavirus case on January 27 ("Bayerische Behörden bestätigen," 2020).

Turkish Airlines announced on January 30 that the number of flights to Beijing, Guangzhou, Shanghai and Xian regions, from February 5 to February 29, will be reduced ("Airlines Suspend China," 2020) A day later, Turkish Airlines announced that the flights to China were cancelled until 9 February 2020. Thus, Turkey introduced first flight restrictions, in the context of preventive measures against COVID-19 pandemic (Sahin, 2020).

While Spain reported the first case on January 31, 2020, it also announced that the infected person was in the Canary Islands and was a tourist from Germany ("Confirmado el coronavirus," 2020). On the same day, coronavirus was detected in two Chinese tourists in Milano, and this was the first reported case in Italy ("Conte, primi due casi di coronavirus confermati," 2020). On February 19, 2020, Iran reported 2 cases. On the same day, it announced that these 2 cases were under treatment ("Iran Reports Two," 2020). Turkey announced that visitors from Iran would undergo the medical examination and those with symptoms would not be accepted to the country, on February 21 (Alhas, 2020). Two days later, Turkey announced temporary cancellation of border crossings

∗ Corresponding author. E-mail address: fgunay@mersin.edu.tr (F. Günay).
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from Iran and Nakhichevan, as a result of the increase in the number of cases in Iran ("Turkey, Pakistan Shut Iran Border," 2020) on February.

25, 2020, Turkish Civil Aviation Authority suspended passenger flights to and from Iran (Aydın, 2020). With the rapid increase in the number of cases and deaths in Italy, Turkey decided to cancel flights to and from Italy on February 29, 2020.

The first novel coronavirus case was diagnosed in Turkey on March 11, 2020, and it also announced that the first confirmed case was a Turkish citizen who had travelled from Europe ("First coronavirus case," 2020). Therefore, Turkey took significant measures to prevent the spread of the virus. One of the most important measures taken in this context is the cancellation of international flights. On March 13, 2020, Turkey cancelled passenger flights to and from Germany, France, Spain, Norway, Denmark, Belgium, Austria, Sweden and Netherlands ("Türkiye'nin uçuş yasağı," 2020).

On March 28, 2020, all commercial passenger flights to or from Turkey was cancelled by a presidential enactment ("Turkey cancels international flights," 2020) The dates on which international flights were cancelled within the scope of preventive measures taken against COVID-19 pandemic by Turkey are presented in Table 1.

Table 1. Cancelled International Flights by Turkey *("Türkiye'nin uçuş yasağı," 2020).*

Date	Flight cancellations by Turkey (in both directions)
February 3, 2020	China
February 23, 2020	Iran
February 29, 2020	Italy, South Korea, Iraq
March 13, 2020	Germany, France, Spain, Norway, Denmark, Belgium, Austria, Sweden, Netherlands
March 16, 2020	England, Switzerland, Saudi Arabia, Egypt, Ireland, United Arab Emirates
March 21, 2020	Sri Lanka, Kuwait, Bangladesh, Mongolia, Turkish Republic of North Cyprus, Ukraine, Kosovo, Morocco, Lebanon, Jordan, Kazakhstan, Uzbekistan, Oman, Slovenia, Moldova, Djibouti, Equatorial Guinea, Canada, India, Hungary, Guatemala, Poland, Kenya, Sudan, Chad, Philippines, Latvia, Taiwan, Peru, Sri Lanka, Ecuador, Niger, Tunisia, Algeria, Ivory Coast, Finland, Angola, Czechia, Dominican, Cameroon, Montenegro, Colombia, North Macedonia, Mauritania, Nepal, Portugal, Panama
March 28, 2020	All commercial passenger flights

2.2. Outbreaks that Have Affected Tourist Demand in the Past Two Decades

Diseases with their origins in Central Asia, Central America and Central Africa have significantly damaged the image of several countries as a safe tourist destination in the last two decades. One of these diseases is Severe Acute Respiratory Syndrome (hereafter SARS) epidemic, which first infected people in the Guangdong province of southern China in 2002 and received worldwide attention in 2003. The other one is H5N1 Avian Influenza (hereafter Avian Flu or Bird Flu) epidemic, which first infected people in Hong Kong SAR, China in 1997 and received worldwide attention in 2004 (McAleer, Huang, Huo, Chen & Chang, 2010). With its origin in Mexico, namely the H1N1 Swine Influenza (hereafter Swine Flu) epidemic, which received worldwide attention in 2009 (Haque & Haque, 2018) and the Ebola Virus Disease (hereafter Ebola) epidemic, which was first identified in the Democratic Republic of Congo in 1976 but received worldwide attention in 2014 (Sifolo & Sifolo, 2015) are some common examples.

SARS epidemic mainly affected the countries in Asia, namely China, Hong Kong, Singapore, and Taiwan. SARS epidemic is estimated to have cost these four countries over the US $20 billion in lost GDP, and a reduction of more than 70% across the rest of Asia, even in the countries were no case was detected (Mckercher & Chon, 2004). Industry data suggested that international tourism to China, Hong Kong, Taiwan and Vietnam declined by 58 per cent in the first quarter of 2003 (Henderson, 2003). Pine and McKercher stated that after SARS epidemic, Singapore's tourism gross domestic product (GDP) decreased 43% and the number of lost tourism-related jobs was 17.500; Hong Kong's tourism GDP decreased 41% and lost tourism-related jobs was 27.000; China's tourism GDP decreased 25% and lost tourism-related jobs was 2.8 million, and Vietnam's tourism GDP decreased 15% and lost tourism-related jobs was 62.000. Kuo et al., (2008) reported that damage levels in Taiwan and China were less noticeable than those in Hong Kong and Singapore, which signifies that the government's reaction and strategies in dealing with this serious disease may result in different levels of damage. For example, Au et al., (2005) asserted that the impact of SARS on Hong Kong's tourism industry is said to be more damaging than the 9-11 episode or the 1997 Asian Financial crisis. In Singapore, visitor arrivals fell dramatically for April 2003 to June 2003 quarter, reaching rare figures, which were over 70% lower than the previous year in May (Henderson and Ng, 2004). Also, Canada is another SARS-infected country with 251 cases and 41 deceases. In Canada, during April 2004 to June 2004 quarter, international visitors declined by 14%, spending by international visitors declined by 13%, the international travel deficit grew to over $1.1 billion and the tourism employment decreased by 2.4% (Wall, 2006).

Avian Flu infections suddenly spread in eight Asian countries, namely China, Japan, South Korea, Laos, Thailand, Cambodia, Vietnam, and Indonesia, between the end of 2003 and the beginning of 2004 (Kuo, Chang, Huang, Chen and McAleer, 2009). Brahmbhatt (2005) estimated that the Avian Flu outbreak led to a 5% decline in international tourist demand and decreased the GDP of Vietnam by 0.4% in 2004. In contrary, Kuo et al. (2008) stated that the number of affected cases had a significant impact on the tourist demand for SARS-infected countries, but not for Avian Flu-infected countries because SARS was able to spread between humans. However, the H5N1 Avian Flu virus is currently only transmitted from birds to humans and so its ability to spread among humans is still weak and the number of cases is small compared to SARS.

Swine flu was first recorded in Mexico in March 2009 and then spread into coterminous regions in American Continent and then to regions further afield, especially to Central and East Europe, Middle East and South-east Asia (Page, Song and Wu, 2012). Haque and Haque (2018) reported that Brunei lost nearly 15% of tourist demand from June 2009 to May 2010 (post swine flu) period. Page et al. (2012) estimated that the swine flu pandemic had a significantly negative effect on the United Kingdom tourism demand in all 14 source markets, especially mainland China, Spain, South Korea, and Russia, in the second quarter of 2009.

The Ebola outbreak of 2014 which started from Guinea in December 2013, spread to other West African countries, namely Sierra Leone and Liberia. Novelli, Burgess, Jones and Ritchie (2018) stated that whole continent of Africa's tourist arrivals reduced by 2% in 2014, and a further 5% in October 2015, after the Ebola outbreak. Mizrachi and Fuchs (2016) mentioned about a 20% to 70% decline in bookings in 2014 as a result of the Ebola outbreak in Kenya.

2.3. Foreign Visitor Arrivals to Turkey

Tourism is one of the most important sectors for the Turkish economy. It is widely accepted that tourism is an important instrument, which increases foreign exchange incomes, decreases unemployment rates and triggers overall economic growth (Isik 2012; Isik, 2010). When examining tourism demand, the number of foreign visitors is one of the important variables. When the number of foreign visitors to Turkey is analysed, except 2006, 2012, 2015, 2016, it stands out a general upward trend. Considering these years, it is possible to identify significant crises affecting the numbers.

In 2006, foreign visitor arrivals declined about 1,3 million compared to the previous year, after a 3,5 million increase. In 2005 and 2006, a series of terrorist attacks were organized by Kurdistan Workers' Party (PKK - PYD/YPG) in Istanbul and the tourism destinations in the southern shore of Turkey, namely Kusadasi, Cesme, Marmaris and Antalya. In these attacks, terrorists targeted the tourists directly. Also, in 2006, Andrea Santoro, the pastor of the Santa Maria Catholic Church in Trabzon, was killed in a Fetullah Terrorist Organization (FETO) linked armed attack. These terror attacks were accepted as the main determinants of a 1,3 million decline in foreign arrivals to Turkey in 20**0**6.

In 2012, foreign visitor arrivals increased only about 300 thousand. In 2011, there was a 2,8 million increase compared to 2010. The main reason for this slight increase is the conflict which started in the border of Turkey and Syria, namely the Syrian Civil War.

In 2015, a slight decline was observed in foreign visitor arrivals to Turkey, about 250 thousand, compared to the previous year. In this year the Islamic State of Iraq and the Levant (ISIS) organized a series of attacks in Diyarbakir, Sanliurfa and Ankara. Also, Turkey shot a Russian fighter aircraft down which committed a border violation while flying over Syria in 2015. This is a major crisis affecting Russian visitors' arrivals. But in 2016 a major decline of 10,9 million in foreign visitor arrivals to Turkey was observed. In 2016, ISIS targeted directly the touristic places and governmental structures in different cities. In Istanbul, Sultanahmet Square, Istiklal Street, Ataturk Airport and Besiktas Stadium were targeted by ISIS with bombing attacks. Also, Kızılay Square in Ankara was targeted by another terrorist group, namely PKK - PYD/YPG, in 2016. There are other terrorist attacks committed by ISIS and PKK - PYD/YPG in some other cities, namely Diyarbakir, Mardin, Gaziantep, Adana and Kayseri, which are also touristic cities of Turkey. But the massive effect happened after the coup attempt organized by the FETO/Parallel State Structure in July 2016. This was the biggest political crisis in Turkey in the last 35 years and had effects tourist arrivals dramatically.

Table 2: Number of Foreign Visitors to Turkey (2000-2019)

Years	Numbers	Year	Months	Numbers
2000	10,428,153			
2001	11,618,969			
2002	13,256,028			
2003	14,029,558		*January*	1,539,496
2004	17,516,908		*February*	1,670,238
2005	21,124,886		*March*	2,232,358
2006	19,819,833		*April*	3,293,176
2007	23,340,911		*May*	4,022,254
2008	26,336,677	*2019*	*June*	5,318,984
2009	27,077,114		*July*	6,617,380
2010	28,632,204		*August*	6,307,508
2011	31,456,076		*September*	5,426,818
2012	31,782,832		*October*	4,291,574
2013	34,910,098		*November*	2,190,622
2014	36,837,900		*December*	2,147,878
2015	36,244,632		**Total**	**45,058,286**
2016	25,352,213			
2017	32,410,034			
2018	39,488,401			

Source: Turkish Ministry of Culture and Tourism, 2020a

After political stability, foreign arrivals to Turkey reached over 32,4 million in 2017, 39,4 million in 2018 and 45 million in 2019. On the other hand, in 2019, the average spending of a foreign visitor was $642 and total revenue from foreign visitors were $28.7 billion (Ministry of Culture and Tourism of Turkey, 2020b).

3.Methodology

There are several methods to forecast tourism demand and income. Some approaches, which use statistical and econometric methods (Isik et al., 2019; Isik et al., 2018) to forecast, are quantitative and objective. The others are subjective, grouped as qualitative techniques (Uysal & Crompton, 1985). Quantitative approaches try to predict what will happen in the future by calculating the past trends and the relationship between variables affecting demand (Calantone, Benedetto & Bojanic, 1987). Such approaches need historical data to forecast future tourism demand and the conditions should be stable during the estimated future or ceteris paribus. This assumption should be met depending on accurate forecasting and the validity of the results. Time series regression, gravity models, neural networks models and other econometric models can be listed as quantitative methods (Uysal & Crompton, 1985; Kulendran & Witt, 2003: Song & Turner, 2006; Kaplan & Aktas, 2015).

Quantitative methods are not useful when the future is unclear or there is no similar experience. Any historyless event cannot be predicted by quantitative method (Schnaars, 1987). In such cases, subjective methods, called as qualitative or judgmental, can be used to forecast the future due to the advantage of not requiring historical data (Frechtling, 2001). Those methods, classified as a qualitative approach, are appropriate where historical data are insufficient or inappropriate to forecast future (Uysal & Crompton, 1985: 7). The Delphi Model, Traditional survey methods, Judgement-Aided Model (JAM), Scenario Analysis (or Subjective probability assessment) are some of those qualitative methods to forecast (Uysal & Crompton, 1985; Calantone et al., 1987; Frechtling, 2001).

Scenario analysis is one of the techniques used in the economy, finance or other fields to predict the future. In accounting, finance and economy, it is important to estimate the future for any investment decision such as capital investments or portfolio selection. This technique is also used for risk management in finance (Altay, 2014; Hassani, 2016). In accounting, it is also used for budgeting process to forecast costs and revenues (De Kluvyer, 1980). The technique is mostly studied in economy-based papers. Based on the information mentioned above, this study aims to make projections to see the effect of COVID-19 on the number of foreign visitors to Turkey in 2020 within the scope of alternative scenarios. Within this context, we generated two hypothetical scenarios in which the change rate of the tourism demand is constant for each month or decline will recover with an equal proportion from the dropped rate until December. Each scenario has a set of alternatives covering border closure and every alternative was calculated for three-basis decline rate. The study covers only the monthly estimates of Turkey's 2020 international demand to put forth the yearly drop under alternative scenarios compared to 2019. The tourism statistics were obtained from the February 2020 bulletin of the relevant Ministry. Tourism is currently one of the most affected sectors from COVID-19 pandemic and UNWTO has revised its 2020 forecast for international arrivals and receipts, and it also emphasizes that any predictions are likely to be further revised (UNWTOb, 2020).

Hypothetical Scenarios: Two scenario sets are presented with relevant alternatives. The first scenario expects a decrease in demand or at the same level compared to the same month of the previous year. In the second scenario, for every month after the opening of the borders, demand will recover from the drop evenly. The second scenario is that decline will be at the same proportion for each month after the borders are opened. This hypothetical scenario implies that demand will drop with a hypothetical percentage for the first month after the borders are opened, and then it will recover evenly.

Scenario A. Decline in demand is at the same level for each month:
A.1. Borders will be closed for **one month**
A.2. Borders will be closed for **one and a half months (45 days)**
A.3. Borders will be closed for **two months**
A.4. Borders will be closed for **three months**
A.5. Borders will be closed for **four months**

Scenario B. Decline in demand will recover with equal proportion month by month:
B.1. Borders will be closed for **one month**
B.2. Borders will be closed for **one and a half months (45 days)**
B.3. Borders will be closed for **two months**
B.4. Borders will be closed for **three months**
B.5. Borders will be closed for **four months**

The UNWTO has announced the expectations claiming that international tourist arrivals will be down 20% to 30% for 2020 when compared to 2019 because of travel restrictions (UNWTO, 2020). On the other hand, tourism professionals are hopeful for the after-COVID-19 outbreak (Horuz, 2020). Based on those expectations of stakeholders, we have estimated our projections for Turkey's international tourist arrivals in the context of foreign visitors with different decline rate. Monthly international tourist numbers were calculated by using Formula (1) as shown below.

$$\text{Number of Foreign Visitors}_{tm} = \text{Number of Foreign Visitors}_{tm-1} \times (1 \mp r) \qquad (3.1)$$

tm is the calculated month, and *tm-1* is the same month of the previous year. *r* is the change rate. This calculation has been done for each forecasted month. Then the number of yearly arriving foreigners has been calculated as the sum of monthly data for 2020. Lastly, forecasted yearly data for 2020 was proportioned to 2019 as shown in formula (2) to put forth the rate of change percentage.

$$\text{Estimated Rate of Change (\%) for Foreign Visitors}_t = \frac{\text{Number of Foreign Visitors}_t}{\text{Number of Foreign Visitors}_{t-1}} - 1 \qquad (2)$$

4.Findings

According to the analyses, the estimated number of foreign visitors and the annual decrease for alternative scenarios have been shown in Table 3 to 7. Table 3 shows the one-month border closure alternative for two scenarios under different decline rates.

Table 3: Estimated number of foreign visitors and annual change rate (what if borders are closed for a month)

	Scenario A.1.** Hypothetical monthly decline rate and estimated numbers				Scenario B.1.*** Hypothetical monthly decline rate for the first month and estimated numbers			
Months	**30%**	**20%**	**10%**	**0**	**30%**	**20%**	**10%**	**0**
Jan*	1787435	1787435	1787435	1787435	1787435	1787435	1787435	1787435
Feb*	1733112	1733112	1733112	1733112	1733112	1733112	1733112	1733112
Mar	1171988	1171988	1171988	1171988	1171988	1171988	1171988	1171988
Apr	1152612	1317270	1481929	1646588	1152612	1317270	1481929	1646588
May	2815578	3217803	3620029	4022254	2966412	3318360	3670307	4022254
Jun	3723289	4255187	4787086	5318984	4122213	4521136	4920060	5318984
Jul	4632166	5293904	5955642	6617380	5376621	5790208	6203794	6617380
Aug	4415256	5046006	5676757	6307508	5361382	5676757	5992133	6307508
Sep	3798773	4341454	4884136	5426818	4816301	5019807	5223312	5426818
Oct	3004102	3433259	3862417	4291574	3969706	4076995	4184285	4291574
Nov	1533435	1752498	1971560	2190622	2108474	2135856	2163239	2190622
Dec	1503515	1718302	1933090	2147878	2147878	2147878	2147878	2147878
Total	31271259	35068220	38865180	42662141	36714133	38696802	40679472	42662141
	0.69	0.78	0.86	0.95	0.81	0.86	0.90	0.95
EACR (%)	-31%	-22%	-14%	-5%	-19%	-14%	-10%	-5%

*Provisional data announced by the ministry
** Decline in demand is at the same level for each month
*** Decline in demand will recover with equal proportion month by month
EACR: Estimated Annual Change Rate

As shown in Table 3, if the number of foreign visitors has dropped 30% as constant for each month of the rest of year, estimated annual change rate will be -31% compared to 2019 due to the one-month border closure. On the other hand, if the demand would be recovered with equal proportion month by month from the basis rate, the rate of change will be -19%. If the monthly rate of demand comes true as 80% compared to the previous year, as a constant decrease, the demand will decline by 22% due to the one-month border closure. In the event of recover from the basis rate, demand will decline by 14%. As can be seen in Table 3, the number of tourists will drop 5% even if demand remains the same.

The estimated number of foreign visitors and annual change rates are shown in Table 4 if border closure lasts one and a half months (until the 30th of April) for two scenarios.

Table 4: The estimated number of foreign visitors and annual change rate (what if borders are closed for one and a half months)

	Scenario A.2.** Hypothetical monthly decline rate and estimated numbers				Scenario B.2.*** Hypothetical monthly decline rate for the first month and estimated numbers			
Months	**30%**	**20%**	**10%**	**0**	**30%**	**20%**	**10%**	**0**
Jan*	1787435	1787435	1787435	1787435	1787435	1787435	1787435	1787435
Feb*	1733112	1733112	1733112	1733112	1733112	1733112	1733112	1733112
Mar	1171988	1171988	1171988	1171988	1171988	1171988	1171988	1171988
Apr	0	0	0	0	0	0	0	0
May	2815578	3217803	3620029	4022254	2815578	3217803	3620029	4022254
Jun	3723289	4255187	4787086	5318984	3951473	4407310	4863147	5318984
Jul	4632166	5293904	5955642	6617380	5201261	5671756	6144899	6617380
Aug	4415256	5046006	5676757	6307508	5226401	5586560	5947349	6307508
Sep	3798773	4341454	4884136	5426818	4728929	4961740	5194008	5426818
Oct	3004102	3433259	3862417	4291574	3923786	4046525	4168835	4291574
Nov	1533435	1752498	1971560	2190622	2096644	2127970	2159296	2190622
Dec	1503515	1718302	1933090	2147878	2147878	2147878	2147878	2147878
Total	30118648	33750949	37383251	41015553	34784485	36860078	38937976	41015553
	0.67	0.75	0.83	0.91	0.77	0.82	0.86	0.91
EACR (%)	-33%	-25%	-17%	-9%	-23%	-18%	-14%	-9%

*Provisional data announced by the ministry
** Decline in demand is at the same level for each month
*** Decline in demand will recover with equal proportion month by month
EACR: Estimated Annual Change Rate

If the number of foreign visitors has been as 70% at the same level for each month of the rest of year (Scenario A), the estimated rate of change is -33% compared to 2019 due to the three-month border closure, but if Scenario B comes true, the change of demand will be -23% (Table 4). If the number of foreign visitors declines by 20% compared to the previous year at the same level for each month, the demand will decline by 25% due to the three-month border closure. If Scenario B comes true, demand will decline by 18%. As seen in Table 4, the number of tourists will decline by 37%, even if the demand remains the same.

The forecasted number of foreign visitors and estimated annual change rates depending on two scenarios have shown in Table 5.

Table 3: *Estimated number of foreign visitors and annual change rate (what if borders closed for two months)*

	Scenario A.3.** Hypothetical monthly decline rate and estimated numbers				Scenario B.3.*** Hypothetical monthly decline rate for the first month and estimated numbers			
Months	**30%**	**20%**	**10%**	**0**	**30%**	**20%**	**10%**	**0**
Jan*	1787435	1787435	1787435	1787435	1787435	1787435	1787435	1787435
Feb*	1733112	1733112	1733112	1733112	1733112	1733112	1733112	1733112
Mar	1171988	1171988	1171988	1171988	1171988	1171988	1171988	1171988
Apr	0	0	0	0	0	0	0	0
May	1407789	1608902	1810014	2011127	1407789	1608902	1810014	2011127
Jun	3723289	4255187	4787086	5318984	3951473	4407310	4863147	5318984
Jul	4632166	5293904	5955642	6617380	5201261	5671756	6144899	6617380
Aug	4415256	5046006	5676757	6307508	5226401	5586560	5947349	6307508
Sep	3798773	4341454	4884136	5426818	4728929	4961740	5194008	5426818
Oct	3004102	3433259	3862417	4291574	3923786	4046525	4168835	4291574
Nov	1533435	1752498	1971560	2190622	2096644	2127970	2159296	2190622
Dec	1503515	1718302	1933090	2147878	2147878	2147878	2147878	2147878
Total	28710859	32142048	35573237	39004426	33376697	35251176	37127961	39004426
	0.64	0.71	0.79	0.87	0.74	0.78	0.82	0.87
EACR (%)	-36%	-29%	-21%	-13%	-26%	-22%	-18%	-13%

*Provisional data announced by the ministry
** Decline in demand is at the same level for each month
*** Decline in demand will recover with equal proportion month by month
EACR: Estimated Annual Change Rate

As shown in Table 5, if the number of foreign visitors comes true by 70% as constant for the previous same months of the year, the rate of change will be -36% compared to 2019 due to the two-month border closure. But, if the demand would be recovered by an equal proportion from the basis rate, the change will be -26%. If the rate of demand has been as 80% compared to the previous year, as constant for the same months of 2019, the demand will decline by 29 % due to the two-month border closure. In the event of Scenario B, demand will decline by 22%. As can be seen in Table 4, the number of tourists will drop 13% even if the demand remains the same.

Estimated number of foreign visitors and annual change rates are shown in Table 6 for two scenarios if border closure lasts three months.

Table 6: Estimated number of foreign visitors and the rate of percentage change (what if borders closed for three months)

	Scenario A.4.** Hypothetical monthly decline rate and estimated numbers				Scenario B.4.*** Hypothetical monthly decline rate for the first month and estimated numbers			
Months	**30%**	**20%**	**10%**	**0**	**30%**	**20%**	**10%**	**0**
Jan*	1787435	1787435	1787435	1787435	1787435	1787435	1787435	1787435
Feb*	1733112	1733112	1733112	1733112	1733112	1733112	1733112	1733112
Mar	1171988	1171988	1171988	1171988	1171988	1171988	1171988	1171988
Apr	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0
Jun	1861644	2127594	2393543	2659492	1861644	2127594	2393543	2659492
Jul	4632166	5293904	5955642	6617380	4963035	5492425	6066152	6617380
Aug	4415256	5046006	5676757	6307508	5046006	5424457	5886797	6307508
Sep	3798773	4341454	4884136	5426818	4612795	4829868	5155477	5426818
Oct	3004102	3433259	3862417	4291574	3862417	3948248	4148665	4291574
Nov	1533435	1752498	1971560	2190622	2081091	2081091	2154039	2190622
Dec	1503515	1718302	1933090	2147878	2147878	2104920	2147878	2147878
Total	25441425	28405553	31369680	34333807	29267402	30701138	32645086	34333807
	0.56	0.63	0.70	0.76	0.65	0.68	0.72	0.76
EACR (%)	-44%	-37%	-30%	-24%	-35%	-32%	-28%	-24%

*Provisional data announced by the ministry
** Decline in demand is at the same level for each month
*** Decline in demand will recover with equal proportion month by month
EACR: Estimated Annual Change Rate

As shown in Table 6, if the number of foreign visitors is 70% at the same level for each month of the rest of year, the estimated rate of change is -44% compared to 2019 due to the three-month border closure, but if Scenario B comes true, the change of demand will be -35%. If the rate of demand is 80% compared to the previous year, at the same level for each month, the demand will drop 37% due to the three-month border closure. If Scenario B comes true, demand will drop 32%. As can be seen in Table 6, the number of tourists will drop 22% even if the demand remains the same.

If border closure lasts four months for two scenarios, estimated number of foreign visitors and annual change rates are shown in Table 7

Table 7: Estimated number of foreign visitors and the rate of percentage change (what if borders are closed for four months)

	Scenario A.5.** Hypothetical monthly decline rate and estimated numbers				Scenario B.5.*** Hypothetical monthly decline rate for the first month and estimated numbers			
Months	**30%**	**20%**	**10%**	**0**	**30%**	**20%**	**10%**	**0**
Jan*	1787435	1787435	1787435	1787435	1787435	1787435	1787435	1787435
Feb*	1733112	1733112	1733112	1733112	1733112	1733112	1733112	1733112
Mar	1171988	1171988	1171988	1171988	1171988	1171988	1171988	1171988
Apr	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0
Jun	0	0	0	0	0	0	0	0
Jul	2316083	2646952	2977821	3308690	2316083	2646952	2977821	3308690
Aug	4415256	5046006	5676757	6307508	4793706	5298307	5802907	6307508
Sep	3798773	4341454	4884136	5426818	4449991	4775600	5101209	5426818
Oct	3004102	3433259	3862417	4291574	3776585	3948248	4119911	4291574
Nov	1533435	1752498	1971560	2190622	2059185	2102997	2146810	2190622
Dec	1503515	1718302	1933090	2147878	2147878	2147878	2147878	2147878
Total	21263698	23631007	25998316	28365625	24235963	25612517	26989071	28365625
	0.47	0.52	0.58	0.63	0.54	0.57	0.60	0.63
EACR (%)	-53%	-48%	-42%	-37%	-46%	-43%	-40%	-37%

*Provisional data announced by the ministry
** Decline in demand is at the same level for each month
*** Decline in demand will recover with equal proportion month by month
EACR: Estimated Annual Change Rate

As shown in Table 7, if the number of foreign visitors is 70% at the same level for each month of the rest of year, the estimated rate of change is -53% compared to 2019 due to the three-month border closure, but if Scenario B comes true, the change of demand will be -46%. If the rate of demand is 80% compared to the previous year, at the same level for each month, the demand will drop 48% due to the three-month border closure. If Scenario B comes true, demand will drop 43%. The number of tourists will drop 37%, even if the demand remains the same as seen in Table 7.

5.Conclusion

Tourism is one of the most sensitive sectors to crises. Coronavirus pandemic is one of the biggest health crises that the world faced in the modern era. According to the UNWTO, global economic crises affected world international tourism arrivals -4% in 2009, another health event, SARS in 2003 affected world international tourism arrivals -0,4% (UNWTO, 2020). The number of foreign visitor of Turkey declined 30% (can be seen in Table 2) in 2016 due to the 15 July coup attempt by the FETO/PSS.

After the first case was seen in China, Turkey started to take precautions to struggle with the COVID-19. Depending on the developments, preventive measures against pandemic extended from day by day. According to recent information, it aimed to estimate the indirect effects of COVID-19 on the number of foreign visitors to Turkey under alternative hypothetical scenarios. The findings of the study show that if border closure lasts one month, demand will decline by 5%, for 45 days closure decline will be 9%, there will be 13% decline on demand for 2-month closure, 24% decline for 3-months and, 37% for 4- months, compared

to 2019 if there is no demand decline, which is the optimistic scenario. As our estimation of hypothetical Scenario A., in which a decline in demand is at the same level for each month, results show that the demand of foreign visitor could decline between 14% to 53% due to the border closure. If Scenario B will be realized, in which the decline in demand will recover with equal proportion month by month, demand will decline between 10% to 46% under different alternatives due to border closure and decline rate scenarios. This can be regarded as the most influential phenomenon as a health crisis for Turkish tourism in the late 20th and early 21st century. These effects will be recovered within the years, but we should not forget that being healthy is the most important thing for human beings.

According to the estimation results of alternative scenarios, the decline in demand is expected to be in the range of 5% to 53%. This means, if the worst scenario comes true, it will be one of the worst tourism crises that Turkey has experienced. This result shows that COVID-19 will be more effective than other health outbreaks such as SARS (Wall, 2006; McAleer et al., 2010), Avian Flu (Brahmbhatt, 2005), Swine flu (Haque and Haque, 2018) observed in last two decades. Under the assumption that the spending of a foreign visitor remains the same as in 2019 at $642, Turkish foreign visitor receipts will decrease to $13.7 billion (52.8%) as the worst, and $27.4 billion (5.3%) as the best alternative scenario for 2020. It means a loss of tourism revenues to $15.2 billion as the worst, and to $1.5 billion as the best alternative scenario for 2020. Recent news about COVID-19 shows that the future of the pandemic is still unclear. On the other hand, we also carry optimistic views. To minimize the harm of the COVID-19 pandemic to Turkish tourism, it is necessary to develop recovery plans and implement them urgently.

The study has some important limitations, and the findings should be handled under these limitations. The study was conducted by using alternative probabilistic scenarios to forecast the number of foreign visitors to Turkey. In this respect, the findings of the study should be considered under hypothetical scenarios. On the other hand, providing information and shedding light on stakeholders for planning and future decisions makes the study important. It is suggested to estimate and determine the potential and probable effects of COVID-19 on tourism receipt and economic growth for future studies depending on tourism.

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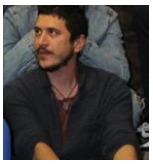
Fatih Günay, received Ph.D. degree in Tourism Management from Mersin University Graduate School of Social Sciences, Turkey in 2019. He is currently working as research assistant at Mersin University Faculty of Tourism. His research interest includes finance, financial management, tourism, accounting, tourism economy, tourism demand, and recreation.
ORCID: 0000-0003-0892-514X



Engin Bayraktaroğlu, received Ph.D. degree in Tourism Management from Anadolu University Graduate School of Social Sciences, Turkey in 2019. He is currently working as assistant professor at Anadolu University Faculty of Tourism. He is the associate editor of Anadolu University's Journal of Tourism, Leisure and Hospitality. His research interest includes destination value, destination development, tourist mobility, philosophy of tourism.
ORCID: 0000-0002-9956-2593

Kahraman Özkul, received his Bachelor's Degree in Hospitality Management from Kocatepe University School of Tourism and Hotel Management. He is currently working as editor at Mavi Deniz Publications. In addition to working in various social responsibility projects, he also serves as the chairman of an educational CSO, namely 'Eğitim İçin Varız.' His research interest includes hospitality management and tourism education.
ORCID: 0000-0002-2124-9636

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Lean thinking in healthcare – review and current situation in Croatia

[a]Aleksandar Erceg, [b]Predrag Dotlić, [c]Agneza Aleksijević
[a] Josip Juraj Strossmayer University of Osijek, Faculty of Economics in Osijek, Osijek - Croatia [b] University Hospital Osijek, Osijek – Croatia, [c] Vukovar Hospital, Croatia

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ABSTRACT

Lean thinking was first introduced in production (mainly in the automotive) sector but its use has spread into the service sectors. Its benefits are well known worldwide and if implemented and used correctly, companies can improve their effectiveness and gain and/or maintain competitiveness. Recently, lean thinking has started being implemented and used in healthcare to accelerate flow in processes, reduce waste in processes and improve the quality of services for "users". The main goal of the paper is to provide a literature review on lean thinking in healthcare worldwide. The review is showing the methods and trends in lean healthcare and some of the most successful implementations. Based on the presented worldwide examples, this paper will try to present a potential for the lean implementation in Croatian healthcare institutions and present potential benefits of the application. Based on the research results, this paper gives suggestions for further research on this interesting and important topic.

I. Introduction

An extremely vibrant business environment creates many opportunities for organizations, both in the for-profit and in the non-profit sector, but also challenges that are often unpredictable. Cost minimization, optimal utilization of resources and successful and profitable business are the basic goals of every organization, regardless of the industry sector. Changes in the economy and the establishment of the global marketplace have affected the way companies do business. For many years, the manufacturer's market, in which the price of selling was the sum of the wanted profit and costs, has been transformed into a customer market by globalization, where profit is the difference between the selling price and the production cost. For organizations to operate successfully in such an environment, they often need to find numerous ways of competing, such as innovation, increased productivity, environmental care, and reduced business costs (Isik et al., 2019). One of the possible approaches is lean thinking methodology. Lean thinking is one of the most up-to-date ways of thinking and working for the whole company. Such a way of thinking and activity uses a variety of models and tools to focus on continuously improving the functioning of the companies with constant perfection. There is a growing research interest associated with the employment of lean thinking for improving the business processes worldwide. Lean thinking, as methodology, uses different tools for implementing a long-term idea aiming for continuous improvement. Its focus is on the elimination of waste perceived by the user/buyer. Thus, the application of lean in the for-profit and non-profit sectors enables businesses or institutions to continuously improve their operations to make it easier to adjust to the changing business ecosystem.

The main goal of this paper is to present the theoretical foundation of the lean thinking methodology, to show the numerous positive aspects of lean thinking in practice and especially in healthcare worldwide. In the empirical part of the paper, we will present an example of lean thinking in two hospitals in the Republic of Croatia. This is important since, in practice, there is still a big misconception that lean thinking can only be implanted in manufacturing organizations. In the final part of the paper, we will present our findings and give proposals for future research.

2. Literature review

Today's lean thinking methodology is an improved Toyota Production System (TPS), presented by Taiichi Ohno during the 1950s. The TPS was based on the wish to organize production in a continuous flow and did not depend on the long production flows for achieving efficiency (Melton, 2005). The main feature of TPS was the acknowledgement that only a small portion of the overall time and effort put into the production add value to the end-user.

The main principle is to use less of everything (i.e. staff, space, inventory, movements, etc.). then in traditional manufacturing processes although more product variations are produced (Womack, Jones & Roos, 1990). Both methodologies, TPS, and lean thinking have revolutionized the production of the automobiles and now with the use of the *kaizen, poka-yoke, and* Kanban, it is the base of every automobile factory worldwide. In other words, the basis of a lean thinking (production) philosophy is focusing on adding value actions to the end-user, methodical detection and waste elimination, and continuous improvement of the production to increase productivity. Lean thinking is a pool of operating methods and philosophies which help generate maximum value for users by reducing waits and waste (Womack & Fitzpatrick, 1999; Womack & Jones, 2003). It seeks to essentially change the company's philosophy and value, which finally changes the company's behavior and culture (Smith et al., 2012). Atkinson (2004) defined lean thinking as *a concept, process and set of tools, techniques, and methodologies that leave behind the success of efficient resource allocation*. This can be driven by the top management of the company or maybe a smaller initiative which is conducted lower in the company. Lean production is one of the projects that big companies which are trying to stay competitive in the global market (Rajenthirakumar & Thyla, 2011) and companies which are implementing lean thinking and/or lean tools are becoming increasingly competitive (Bhasin, 2011).

Slack et al. (2010) state that lean thinking seeks to meet requirements instantly, with flawless quality and without waste. In other words, the flow of products and services always delivers what the customer wants (ideal quality), in exactly the demanded quantity (neither too much nor too little), precisely when it needs to be (neither too early nor too late), precisely where it is needed (not in the wrong location) and at the minimal possible cost. Hopp and Spearman (2004) point out that lean production is an integrated system that ends up producing products and/or services with minimal unnecessary costs. Reid and Sanders (2013) define the lean system as just in time philosophy. Just in time is based on the elimination of loss, that is, the elimination of everything that does not create the extra value for which the customer is prepared to pay. The goal of lean thinking in the first place at its center is to create value for the customer. Žvorc (2013) points out that lean companies focused on:

- customers because goals and strategies are outlined based on his / her wishes,
- according to continuous changes and process improvements,
- towards spotting problems and solving them permanently,
- according to innovation,
- shaping the organizational structure determined during customer value,
- according to the standardization of work.

∗ Corresponding author. E-mail address: aleksandar.erceg@efos.hr (A. Erceg,).
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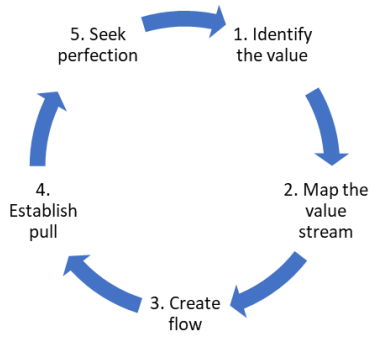
To achieve and implement lean thinking, a company must meet the five principles of rational business (value, flow, value flow, retreat, and perfection) defined by Womack and Jones (2003) as follows: a) the end-user is defining the value, b) value flow is a set of specific activities that are required to bring a product through an internal value chain, c) flow refers to the flow of value creation steps, d) withdrawal is scheduled, and 3). Perfection refers to continuous efforts to improve the process. The principles of rational business can also be represented graphically (Figure 1).

Figure 1: Five principles of lean thinking



Source: Karuppan, Dunlap and Waldrum, 2016: 201

The company's transition from "standard" to lean thinking company is never complete. Numerous authors of lean thinking studies and books (Bicheno, 2008; Ohno, 1988; Womack & Jones, 2003) point out that it is an "ongoing journey" rather than a single event with a destination. Therefore, the final step in achieving lean is continuous improvement to achieve perfection. Businesses must constantly evaluate the values they deliver to their customers to improve the process and lower the efforts and time involved, the space used, the number of costs and the number of errors. The goal is to remove the activities that do not add value to the product (service), don't improve value flow or better meet customer demand. Business process improvement is supported by focusing on improvement activities measured by key business performance indicators at the lowest levels and implementing best practices to ensure strategic management goals.

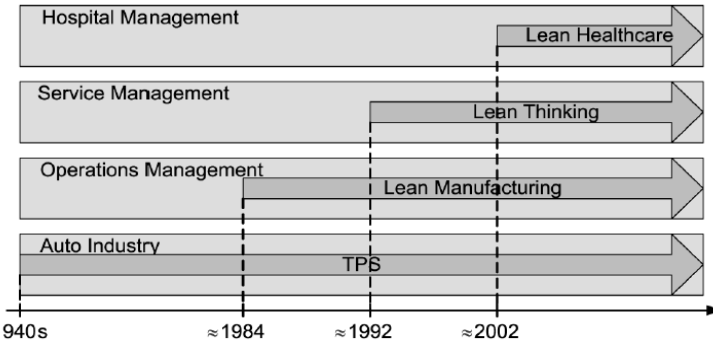
But should lean be implemented only in for-profit organizations? Some studies (Emiliani, 2007; Rivera & Chen, 2007) state that the use of lean is possible in the for-profit and not-for-profit sectors, and the goal is the same – reducing and/or eliminating the activities that do not add value for the final user. Anvari, Ismail and Hojjati (2011) state that, in lean thinking, if the activity does not add value to the customer, then any use of resources is waste. This is supported by other researchers (Pettersen, 2009; Bonavia & Marin, 2006) and by De Toni and Tonchia (1996) who state that preconditions for effective implementation of lean thinking in organizations are increasing employee awareness, top management support, interaction within the organization, close integration and coordination of all activities designed for completing a mutual task. Thus, lean thinking can be implemented in all organizations, for-profit, and not-for-profit, but the application should be tailored to the organization's needs.

3. Lean thinking in healthcare

The significance and applicability of healthcare have developed as a substantial component of the services sector recently. Ebrahimi and Sadeghin (2013) state that increased competitiveness within the health industry became a significant characteristic for healthcare companies to have a competitive advantage. Sunder, Gunesh and Marathe (2018) ranked the healthcare sector as the number one while researching continuous process improvement papers within service sub-sectors. Anthony et al. (2019) state that the health care sector has the highest number of research papers in scientific journals when the topic is in continuous process improvement. Radnor et al. (2012) state that the first implementation of lean thinking was in the UK in 2000, and it was followed by the research in the USA in 2002, and soon after it was globally accepted. The application of lean thinking in the healthcare sector in the United Kingdom was supported by Institution for Innovation and Improvement and NHS Confederation while in the USA, the similar role had Institute for Healthcare Improvement (D'Andreamatteo, et al., 2015). These two organizations acknowledged the impact of lean thinking in eliminating waste in processes and boosting value, and according to Jones and Mitchel (2006), it was a potential response to the demand for the change recognized in the sector.

Toussaint and Berry (2013) defined lean in the healthcare as *an organization's cultural commitment to applying the scientific method to designing, performing, and continuously improving the work delivered by teams of people, leading to measurably better value for patients and other stakeholders.* Laursen, Gertsen & Johansen (2003) presented the evolution of lean in healthcare (Figure 2). According to their research, there is a delay of 10 years in the application of lean thinking in healthcare concerning other service industries, and Berwick et al. (2005) stated that delivery in the healthcare sector is failing to achieve excellence level as in the manufacturing sector.

Figure 2: Evolution of lean healthcare



Source: Adapted from Laursen, Gertsen and Johansen, 2003

The research about lean thinking in healthcare started in the early 2000s (Thompson, Wolf & Spear, 2003; Young et al., 2004) and soon there were books (Fillingham, 2008; Graban, 2008), excellent and often cited studies (King, Ben-Tovin & Bassham, 2006) and other literature (Womack & Miller, 2005; Jones and Mitchell, 2007) about lean implementation in the healthcare sector. These studies, books and other literature cover different countries, methodologies, topics, and cases of lean thinking in the healthcare sector.

In one of the first lean in the healthcare sector implementation reviews, Mazzocato et al. (2010: 4) looked upon *(i) the methods to understand processes to identify and analyze problems, methods to organize more effective and/or efficient processes, (iii) methods to improve error detection, relay information to problem solvers, and prevent errors from causing harm and (iv) methods to manage change and solve problems with a scientific approach*. Their review showed that healthcare sector used different tools and methods (i.e. value stream mapping, Kanban, 5S, process streaming, etc.) in combination and that they have been used in different settings (i.e. hospital departments, hospital-based pharmacies, non-hospital clinics, etc.) and different healthcare fields (i.e. emergency medicine, surgery, nursing, pathology, etc.). Similar reviews of the lean thinking in healthcare research studies have been done by Brandao de Souza (2009), D'Andreamatteo et al. (2015), Message Costa and Filho (2016), Antony et al. (2019).

Brandao de Souza (2009) noticed that early attempts of lean thinking implementation in healthcare were transferring manufacturing principles but in later implementations, four types were noted: (i) manufacturing-like studies, (ii) managerial and support case studies, (iii) patient-flow case studies and (iv) organizational case studies. Message Costa and Filho (2016) noted that recent studies of lean thinking in healthcare include lean implementation processes difficulties, basic concepts of lean thinking implementation, evaluation of implementation processes, and advantages of combination with other methods like agile strategy, supply chain innovation, and Sigma. D'Andreamatteo et al. (2019) in their research proposed several directions for future research on lean thinking in healthcare (Figure 3).

In their research, Antony et al. (2019) concluded that there are still many gaps in the studies about lean healthcare and that they include lack of systematic leanness at organizations level, leanness for organizations learning, the financial side of lean implementation and benchmarks development. Based on their research there are still a lot of open questions regarding lean thinking implementation in the healthcare sector.

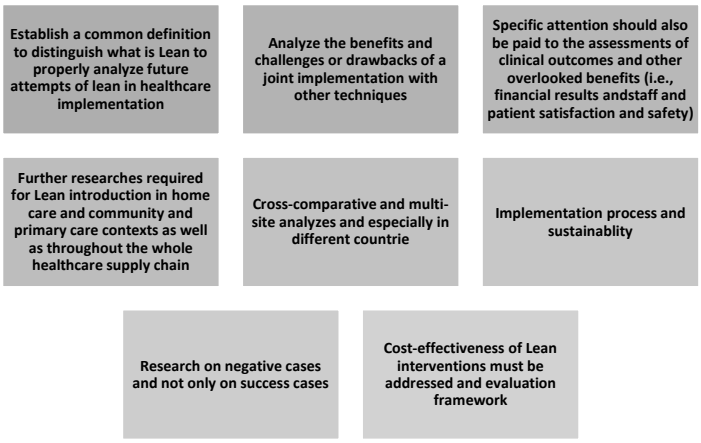
4. Lean thinking in the Croatian healthcare sector

Lean in the healthcare sector in Croatia is still not present in practice, and there are only several research papers about this topic. Žvorc (2013) in his paper researched the potential of implementing lean thinking in non-production companies in Croatia. Štefanić et al. (2015) examined lean management in hospitals and Gudlin et al. (2016) examined the optimization of hospital pharmacies layouts using lean thinking principles.

Besides these three papers, we have found two student graduation theses (Pavlinić, 2017; Zahtila, 2017) on lean thinking in healthcare topics. Based on the found research, we can state that there is a need to introduce the possibility of implementing lean thinking in the Croatian healthcare sector to practitioners but also to academicians.

Thus, we have selected an example of the hospital in Vukovar (Eastern Croatia) to present a lean thinking potential in the Croatian public healthcare sector. The next part of the paper will present a situation in which lean can be useful to improve hospital operations namely its incomes through the establishment of a more adequate billing process.

Figure 3: Future research proposals



Source: Adapted from D'Andreamatteo et al, 2019

4.1. Example from Vukovar Hospital – Improving the process of invoicing

The National Memorial Hospital in Vukovar is an institution that provides healthcare services under the Healthcare Act. It is comprised of hospital services, specialist conciliar healthcare, day hospital, and medication procurement department. For performing the aforementioned services, we are financed from the following sources (Vukovar General County Hospital, 2019):

- contracting and billing healthcare services to insured individuals
- billing healthcare services otherwise than under the contract
- billing healthcare service provided to other healthcare institutions
- contracting and billing fees for services provided to other healthcare institutions
- billing healthcare services to natural and legal persons
- donations from natural and legal persons
- refunds on various claims
- contracted services
- fees for sold goods and admission fees for "Place of Remembrance – Vukovar Hospital 1991" and from product billing – hot meals for employees
- other sources of financing.

Based on what is mentioned above, healthcare is provided to individuals based on (Vukovar General County Hospital, 2019:9): (i) acute care beds – 106, (ii) long-term care beds – 20, (iii) chronic care beds – 5, and (iv) day hospital beds/chairs - 114. The indicated number of contracted beds is at the level of 2018. For the period from January 2019 to October 2019, average hospital stay was reduced from 5.65 to 5.41 days compared to 2018 when the average stay was 6.00 days with a tendency of decreasing, while day hospitals tended to increase in the number of patients (Vukovar General County Hospital, 2019:10). Cumulative income deficit at the National Memorial Hospital in Vukovar entails losses that continue from one year to another, resulting in a negative financial result. Thus, the question is who is in control and which measures are taken to make financial indicators into positive ones. Using a case of palliative care patient and appropriate invoice at the end of treatment, we will see that it is possible to justify contracted beds for chronic patients, 5 of them. According to the International Classification of Diseases, palliative care code is ICD Z51.5. meaning that in that classification, the disease is classified most appropriately for general needs and healthcare assessment (World Health Organization, 2012).

The National Memorial Hospital in Vukovar does not invoice palliative care patients. The hospital financially shows them through acute care and long-term treatment, which in turn results in income deficit. Resources are available, as shown in resource assessment performed in 2014, but individuals still do not comprehend the importance and profitability of billing palliative care. The Croatian Health Insurance Fund (CHIF) pays HRK 550.00 for a single palliative care bed (+ medications, while the price for children is HRK 715.00 + medications per each day of hospital stay) (Croatian Health Insurance Fund, 2019).

Patient V. H. was hospitalized at the Abdominal Surgical Ward with a C25.1 diagnosis (malignant disease of hepatobiliary system and pancreas) from May 25, 2019, to July 12, 2018, a total of 48 days. Invoice for that period, according to the diagnostic-therapy group (DTG) and long-term treatment, amounts to HRK 20,700.00, which the hospital billed to the CHIF (National Memorial Hospital in Vukovar, 2019). In the case billing department has used an improved process of internal invoicing, the hospital could have billed HRK 42,444.12 and simulation of such an invoice clearly shows that the hospital has lost HRK 21,744.12 of potential revenue. According to the author's assessment, the hospital at any point cares for approximately 5 palliative patients, noting that the number of beds contracted with the CHIF is in force since January 1, 2018. Hospitalization of such patients requires correct palliative care invoicing (ICD Z51.5), which in turn results in financial viability.

To highlight the significance of correct invoicing, hospital's senior management needs to be educated on correct invoicing and encourage the work of palliative care team (physicians and nurses), which is competent to declare a patient as palliative patient and to ask patient's family to deliver a red referral slip to the hospital that indicates that the patient is referred to palliative care with palliative care diagnosis.

We believe that if the invoicing department is not formed, the same should be formed from existing human resources, healthcare and non-healthcare employees (educated individuals working in the management) to increase invoicing efficiency and justify monthly limit which should be rationally managed and indicators of that limit should ultimately be positive. This example in National Memorial Hospital Vukovar shows the importance of changing and improving the process of internal invoicing which will remove waste in operations and as a result will create a better result for the organization and in this case, this is increased turn-over.

The lean approach to solving these problems and similar ones considered to be the "waste" of unused potential is to define the root cause of the problem. From what is seen above, it probably lies in the management approach. The lean approach would be more bottom-up oriented and founded on the "Gemba" principle which requires managers to address issues at their origin. Such an approach would imply that stuff who identified the problem would be able to suggest its solution. A further step would include the creation of standard operating procedures for the billing process which should define all the necessary steps and rules needed to accomplish adequate invoicing. To make it a sort of "knowledge database", it should be a part of a "hospital billing manual" and disseminated throughout the system via the internal network, preferably intranet. To make it even more "lean", visual management rules could be applied in the creation of such a manual. The use of pictograms and diagrams would enable even less adequately trained hospital staff to participate in the process without fear of making crucial mistakes.

4.2. How to be better - proposals for applying lean in Croatian healthcare

The goal of lean thinking in the first place of its center is to create value for the end-user, i.e. the customer. In the case of the healthcare system, the end-user is the patient. Organizations in healthcare systems that have implemented the lean thinking focused on (i) towards patients, (ii) towards process improvements (to reduce waiting time and therefore health system costs) and (iii) towards innovation (more innovation means better quality of service provided to the patient, better efficiency and better cost control). The quality implementation of lean thinking achieves the efficient functioning of the healthcare system, which strikes a balance between needs and expectations of end-users, namely *improving the health status of individuals, families, and society; protecting the population from all health threats; protecting users from the financial consequences of sickness benefits and equitable access of users to all health centers* (Mateljak & Kekez-Poljak, 2015: 129).

Long waiting lists, unnecessary movement of healthcare personnel, long waiting for a patient to undergo a medical examination, excessive documentation, breakdown of medical equipment and lack of communication are some of the problems that arise in the health care system of the Republic of Croatia, which can be solved by implementing the lean methodology. The primary goal that should be achieved by implementing lean and addressing these issues is to reduce costs in the healthcare system.

The advantages of the lean methodology are that its implementation detects all losses that adversely affect the health system's operations and eliminate them. Lean methodology in the health care system of the Republic of Croatia requires further digitalization of the system which will influence the processes in the health care system. Better digitization of hospitals would reduce waiting lists, eliminate unnecessary writing of the same patient notes on numerous documents (all available in one folder on a computer), better coordination and scheduling of medical staff, which would reduce waiting lists because the doctor was able to handle more patients per day, etc. The lean methodology required and preventive maintenance of medical equipment which reduced the number of medical equipment failures. In his research Pavlinić (2017) examined the triage process in the hospital. The research results showed an increased level of triage process performance in the form of a 63.3% process improvement per average patient, bringing almost three times the time available to a triage nurse or patient processing technician. They proposed the digitization of emergency patient records, which aims to eliminate process losses due to unnecessary waiting and queue creation, as well as to eliminate unnecessary paperwork.

The biggest challenge lean faces in many organizations are the change in a way of thinking necessary for a lean culture to develop and root itself within the organization. It usually starts with the top management who should develop a completely different paradigm to the one it has been used to so far. According to Toussaint and Berry (2013) who described lean as an operating system, lean composed of six essential principles, a culture of respect for the people who do the work is probably the most important principle and the precondition of successful lean implementation. The lean buzzword for such an approach is Gemba and it requires top managers to experience firsthand problems and barriers and thus create and support environment for innovation and continuous improvement which lean is all about.

5. Conclusion

The importance of the lean approach is proved in many different studies around the world and mostly in the production sector. There is a momentum of implementing a lean thinking approach in the service and especially the health sector. Every public healthcare system in the world is constantly under pressure to lower costs while improving quality at the same time. The Croatian one is no exception. Lean, as an innovative approach, has a proven record of success in healthcare organizations worldwide. Its underlying goal of improving value for the client, in this case, the patient, is achieved through constant quality improvements while increasing the efficiency of the organization.

With the implementation of lean thinking in the Croatian healthcare system, the quality of health care delivery would increase, leaving patients more satisfied and less frustrated. The lean environment would provide better service delivery, more satisfied patients, better patient flow through the system, a well-designed pull system, reduce service delivery deficiencies, and keep medical staff more synchronized. Such a lean environment would reduce the losses occurring in the health care system of the Republic of Croatia.

Due to the lack of understanding and implementation of lean thinking in the Croatian health sector, research about this topic would help not only academicians in understanding the principles of lean thinking but practitioners as well. Thus, further research about lean thinking in the Croatian health sector is not only suggested but recommended. Further research about the potential of lean thinking and approach to improving both medical and managerial aspects of the healthcare system in Croatia is suggested based on the examined case because of the importance and the impact it has on social sustainability.

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Aleksandar Erceg, Ph.D. is an Associate Professor at the Faculty of Economics in Osijek, J.J. Strossmayer University of Osijek. He previously worked as deputy purchasing manager at two local production companies in Osijek (Saponia d.d. and Kandit d.o.o.). He has published more than 30 scientific articles in peer-reviewed journals. His research focuses on entrepreneurship, franchising, operations management, and lean thinking. Currently, he is teaching courses on undergraduate and graduate level – Entrepreneurship, Franchising, Sourcing and Operations Management.

Predrag Dotlić, M.Sc., currently works as Internal Auditor after two years with the Financial Department at the University Hospital Osijek. Previously he was been an owner of the small family company. Pursuing the interest in the Operations Management through consulting work for Center for Entrepreneurship Osijek and as a teaching assistant at Faculty of Economics Osijek and International Center for Entrepreneurial Studies Osijek. Currently working on PhD thesis exploring the lean management potential for the transfer of best entrepreneurial practices into the public health sector hospital management.

Agneza Aleksijević, Ph. D. is assistant director at the National Memorial Hospital in Vukovar. In addition, she is associate professor at the School of Medicine, University of Zagreb and at the Faculty of Dental Medicine and Health, Josip Juraj Strossmayer University of Osijek and an external associate and lecturer at the Polytechnic Lavoslav Ružička Vukovar. Considering the complexity of today's business environment, it is necessary to constantly develop and integrate managerial activities into the healthcare system through processes that synergistically integrate various aspects of action through research work she have been doing for many years.

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The benefits of using cloud technology in Bosnia and Herzegovina

[a]Kasim Tatić, [b]Zijad Dzafić, [c]Mahir Haračić, [d]Merima Haračić
[a]School of Economics and Business, University of Sarajevo - Bosnia and Herzegovina, [b]University of Tuzla, Univerzitetska 8, 75000 Tuzla - Bosnia and Herzegovina, [c]BH Telecom, Zmaja od Bosne 88 - Bosnia and Herzegovina, [d] Supplier Quality Assurance Assistant - Quality Department at Prevent

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ABSTRACT

The primary goals of the research are to identify the perceptions of top management in domestic companies in BiH, to determine the willingness of domestic companies to migrate to the cloud and systemize the benefits of using Cloud technology in BiH. *The advancement of information and telecommunications technology has enabled large and small companies to access cutting-edge technology, thanks to which they can increase profitability and competitiveness while reducing business costs. The research results indicate companies' top management does not have enough information/data related to the benefits of Cloud technology, and thus partially or insufficiently consider the possibility of business migration to the cloud. Certain companies base their business on Cloud technology, but most companies have hardware resources they use as a basis for creating a platform necessary for the operation of one or more information systems. According to the research results, we can conclude the managers are not familiar with the potential benefits of Cloud technology, which serves as direct evidence for the hypothesis. However, it is expected, SMEs and large companies will completely or partially switch to Cloud technology, in future.*

I. Introduction

The advancement of information and telecommunications technology has created some preconditions for innovations and concepts of business that directly affect the way of transacting business in large companies, but also in small enterprises or the so-called SMEs (Small and Medium-sized Enterprises). Certain comparative advantages of large companies, which also represented entry barriers to the market for many companies, are easily accessible in a few clicks with the help of new information and telecommunications technologies, primarily referring to Cloud technology. Cloud technology is expanding, and there are a growing number of cloud providers in the global market (Google Cloud, 2019; Amazon Cloud, 2019, Microsoft Azure, 2019) and local markets (BH Telecom Cloud, 2019). It is important to emphasize the modern cloud is a platform that offers solutions for extremely complex business, covering a number of different information systems (e.g. ERP — Enterprise resource planning, CRM — Customer relationship management, BI — Business intelligence, DMS — Document Management System and dr.), which may represent an independent or integrated solution.

The primary goals of the research are set as follows:

- Identify the perception of top management in domestic companies
- Determine the willingness of domestic companies to migrate to the cloud
- Systemize the benefits of using Cloud technology in BiH

The hypotheses are postulated as follows:

- Companies' top management does not completely recognize the benefits of Cloud technology, neither they devote enough attention to utilizing the potentials of Cloud technology in BiH.

Innovation is one of the most important strategies of competition, both for small and large firms. It is often argued that SMEs are innovate in specific ways, different from the innovation process in large firms. While there are certain size-specific features, the heterogeneity of the SME sector prevents simple generalizations.

2.Literature review

Possessing and using advanced technology represents a comparative advantage in the market, over competitors who do not utilize it or only partially. Nowadays, Cloud technology is considered as one of the most significant technologies, achieving a high degree of utilization and providing excellent business support, as well as flexible infrastructure (Mohiuddin, Abu Sina & Mahmudul 2012). Cloud technology has many advantages, supporting companies to devote time and energy to business development rather than establishing, maintaining and developing a platform necessary for the operation of multiple information systems (e.g. ERP, CRM, BI, WMS, etc.). It is supremely important to point out companies operating in an extremely demanding market and are expected to carry out daily changes in their businesses. Accordingly, it is necessary to provide an adequate level of flexibility/agility at reasonable costs, taking into account that companies must be effective in peak loads or peaks (Vivek 2015).

Cloud technology enables SMEs to become competitive, since the benefits previously experienced only by large companies (Makena 2013) in the segment of owning and other Centers, are completely overcome in just a few clicks, while avoiding high fixed costs (Makena 2013). It is significant to emphasize that the costs were not the only obstacle for many companies, and a timeframe represented a fundamentally critical dimension i.e. the process that required significant time necessary for the procurement, installation and configuration of equipment, and subsequent maintenance and improvement. These obstacles/challenges are eliminated by the use of Cloud technology, and one of the most significant benefits is that only in a few clicks, it is possible to stop using certain services and information systems, if there is no need for them, therefore eliminating the costs of using hardware or software on Cloud technology (On-demand computing). The same is applied when a company needs to use more resources in both hardware and software in a short period of time (Vivek 2015).

Thanks to the immense role and importance of Cloud technology in business, we can say that it has an enormous impact (Islam, Weippl & Krombholz 2014) on the business of both small and large companies. Most companies have recognized the benefits and possibilities of Cloud technology, and their migration to the cloud is unquestionable. One of the key questions is: What is the best way to use the contemporary trend and technology to enable their business to operate in the modern economy (IDG 2018; Isik, 2013).

Cloud technology is based on the computing grid (Anurag 2014), and can be defined as a pool of computing resources delivered to the user of Cloud technology. Diverse architecture and cloud models will be presented in detail in a separate section. The architecture and a large amount of computing resources that cloud providers offer, allows companies great flexibility without their investment in infrastructure, staff training and licensing (Subashini & Kavitha 2011). Cloud technology and services enable companies to transform or enhance business in a way that companies, with the same business processes, operate more efficiently, reliably and flexibly (Deloitte 2018), while simultaneously transferring more obligations and responsibilities to the cloud providers (Gorelik 2013).

∗ Corresponding author. E-mail address: kasim.tatic@efsa.unsa.ba (K. Tatić).
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Cloud technology and services can be deployed across the company in several ways (Deloitte 2018). One of the biggest changes in the way information systems are distributed in the B2B (business-to-business) segment (Dempsey & Kelliher, 2018). The services offered by the cloud providers have become more reliable and accessible to end-users, with a flexible price (Aljabre, 2012).

The IT sector is an extremely dynamic environment and only the companies with an agile approach and a flexible IT solution can adapt to the changing and demanding business environment (Vivek 2015). In addition, some of the main responsibilities formerly performed by company staff are now migrating to the cloud service provider, primarily referring to the maintaining responsibility of both hardware and software (if for example SaaS - Software as a service) (Haslinda & Mohd, 2017).

Companies who switched to the cloud can focus more on their businesses (Kiryakova & Yordanova 2017), leaving infrastructure and/or services to the company whose primary business is cloud platform maintenance. The most significant Cloud technology characteristics could be summarized as follows (Kiryakova & Yordanova, 2017):

- On-demand self-service
- Permanent network access
- Pooling and sharing of resources
- Elasticity (scalability)
- Pay-per-use
- Reducing the cost of creating and maintaining IT infrastructure
- Effective use of resources
- Payment for actually used services

Most of the stated characteristics will be presented in the next sections. However, it is important to note that each technology has certain disadvantages and limitations; therefore, Cloud technology is not an exception as well. It is equally important to note that most of the shortcomings or risks are reduced or eliminated with the advancement of technology. For example, some of the limitations of Cloud technology include the followings (Lakshmi, 2014):

- Failure of communication will cut off a cloud service
- Sending data on a publicly accessible communication system
- Deterioration of the quality of service of a cloud provider or a provider ceasing

operations due to bankruptcy.

- Complex legal problems may arise if providers' servers are in a foreign country
- Surveillance of data traffic on the Internet

There are also other limitations/risks which need to be considered or analyzed in a more detailed way. Additionally, each company has distinct characteristics in terms of procedures and business process segment, as well as the information systems it uses. Therefore, it is necessary to analyze/improve internal business processes and information systems before migrating to the cloud. The key motives for the companies to improve business processes, according to one conducted survey are: to save money, reduce costs and/or improve productivity (Tatić, Haračić & Haračić 2018), therefore, the companies consider the same or similar motives for migrating to the cloud.

2.1. Cloud Deployment Models

Cloud Deployment Models include three types: Public, Private and Hybrid cloud. The choice of a model depends on the requirements, needs and company characteristics, as well as the company's existing infrastructure. Companies that have invested significant resources in their infrastructure will rarely migrate fully to the cloud and will primarily choose Hybrid Cloud. Companies that are subject to legal regulations implying the inability to provide services on shared servers, typically migrate to private cloud. Most companies use public cloud primarily because of the low cost and features that in most cases can meet the needs of a large number of companies. Cloud Deployment models will be presented below in more details (Lakshmi 2014; Singh & Stefana 2015; Kiryakova & Yordanova 2017; Si Xue, Wee & Xin 2016):

- *Public Cloud* – this model implies cloud infrastructure shared across multiple users. Public Cloud is an extremely popular model provided by cloud providers (global or local). The payment is usually arranged as "pay per use model" which means paying for the resources utilized in a unit of time (usually 1 hour). Service quality is in most cases defined by the Service Level Agreement (SLA). In most cases, cloud service providers have clearly defined policies, procedures, billing models, and others.
- *Private Cloud* **–** It is managed within an organization and is suitable for large enterprises. Private cloud is cloud infrastructure managed for a single organization.
- *Hybrid Cloud* **–** this model implies a combination of public and private cloud and is frequently used by companies that already possess their data centers or who, due to the specifics of their jobs and procedures, cannot fully migrate to the cloud.
- *Community Cloud* **–** presented models (Public, Private, Hybrid) constitute a community cloud created primarily for a particular industry needs.

2.2. Cloud services: SaaS, PaaS, IaaS

Cloud providers in most cases offer the following main services: (Harshala 2014, p. 2-3.): Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS). However, it is significant to note that they offer other services such as: (Mohiuddin, Abu Sina, Mahmudul 2012, p. 204.): Storage-as-a-service, Database-as-a-service, Information-as-a-service, Process-as-a-service, Application-as-a-service, Platform-as-a-service, Integration-as-a-service, Security-as-a-service, Management/Governance-as-a-service, Testing-as-a-service.

In this paper, we will focus primarily on SaaS, PaaS, IaaS, because these are the most commonly used services and can be used for other services listed above. (Harshala, 2014; Mohiuddin, Abu Sina & Mustaq, 2012, Harjit, Si Xue & Wee Xin, 2016; Buyya & Sukhpal, 2018; Lakshmi 2014; Mitropoulou, Michalakelis, Filiopoulou & Nikolaidou, 2015, Kiryakova & Yordanova, 2017):

- SaaS – these services are the first services offered through Cloud technology and are used by a large number of users. SaaS refers to the provision of services at the customer's request. SaaS benefits include cost savings in purchasing hardware, licenses and providing a flexible IT solution.
- PaaS – is a cloud-based application development environment, used for developing high-level services. Developers and IT administrators have the ability to customize conditions to application parameters and requirements. PaaS is a platform that enables you to build and deliver applications and services that run primarily through web environments and mobile applications.
- IaaS – is a virtualization concept where cloud providers provide users with basic storage and compute capabilities as standardized services over the network. IaaS provides various hardware configuration options based on Cloud technology. The advantages of IaaS primarily relate to the ability to use an extremely complex hardware environment without investing in hardware procurement, which not only applies to servers but also to the network, storage, processing unit, etc.

SaaS is nevertheless the most popular model used by companies of different sizes; however, other models are becoming more and more popular (IDG, 2018). The SaaS model is utilized primarily by end-users, while the PaaS model is used primarily by companies who develop software and various applications, and the IaaS model is used by IT specialists in maintaining hardware resources (Kiryakova & Yordanova, 2017).

The application of Cloud technology enables a platform to offer various services both in the short-term (e.g. test environment, periodic reporting, etc.) and in the long-term (use of Cloud technology for daily business e.g. e-mail services, ERP systems, etc.). This service is provided with exceptional flexibility, adaptability to the requirements and the needs of the company, especially in the unpredictable requirements when companies experience a temporary need for increasing hardware and software resources. For this reason, it is critical to define the following features of Cloud technology (Gorelik, 201; Microsoft, 2019):

- *Vertical scaling (scale-up)* – suppose a company has invested heavily in computing resources and doesn't care about capacity availability until the company's requirements are approaching/reaching limits. When the capacity of the purchased hardware is reached, the company must invest in expanding the capacity or completely replacing the existing hardware. This is a major problem for the companies in need of periodic and significant increases in hardware capacity. This problem in the cloud environment is eliminated with a few clicks, where the company can obtain the extension of computing resources to any desired level, for the period of time it wants. Extension in the context of the vertical scaling involves extending the computing resources of existing servers.
- *Horizontal scaling (scale-out)* **–** enables companies to expand computing resources by adding new servers/clusters. This form of scaling is popular because it allows quick allocation of resources without significant financial investments.
- *Automated elasticity* – implies constant monitoring of the used capacities and scales them according to the needs as defined by the cloud service users. Scaling in this concept not only involves scaling to higher, but also scaling to lower levels, in case capacities are not used.

2.3 Advantages and benefits of using cloud

The impact of Cloud technology on business is enormous in terms of enabling small (SMEs) and large companies to easily utilize innovative technology in their business model without experiencing a need for experts in various areas, which would have been necessary if the company had its own infrastructure. The benefits of Cloud technology not only apply to technological aspects, but also to financial aspects, both in the long-term investment segment and in the cost segment, where most of cloud's payment models are based on the pay-as-you-go principle (Mitropoulou et al., 2015). Business migration to the cloud represents a fundamental change, primarily in the segment of how the data are managed (Vivek, 2015). SMEs have an urgent need for an advanced reporting system such as BI system, and its successful implementation would lead not only to the improvement of the decision-making system, but also to a tremendous increase in efficiency, productivity and effectiveness of SME operations (Tatic, Dzafic, Haracic & Haracic 2018). Cloud technology enables the creation of a large number of information systems, such as ERP (Enterprise resource planning), WMS (Warehouse management system), CRM (Customer relationship management), BI (Business intelligence), ML (Machine learning), AI (Artificial Intelligence), etc. In addition to this, there are numerous other benefits related to reducing deployment time, IT costs, then the complete elimination of maintenance costs, etc. (Haslinda & Mohd 2017). One of the most significant advantages is the flexibility and agility introduced into the business of both large and small companies (Aljabre, 2012). Moreover, companies can take advantage of the latest technology without the high investment required to acquire and deploy their data centers, which have been in the past entry barriers for most companies (Patnaik, Yang, Tavana & Popentiu-Vlădicescu, 2019; Haslinda & Mohd, 2017; Deloitte, 2018). The key benefits of using Cloud technology are related to (Gorelik, 2013; Mitropoulou et al., 2015; Lakshmi, 2014; Harjit, Si Xue & Wee Xin 2016; Stefan, 2015, Kiryakova & Yordanova, 2017):

- Cost Reduction – the application of Cloud technology provides greater control over costs through monitoring the resources used, but at the same time affecting CAPEX (Capital expenditures) and OPEX (operating expenses).
- Pay-As-You-Grow – Cloud technology enables the increase of capacity and resources according to the requirements of the company, which means, large infrastructure investments are not needed for resources that are not currently critical for the company but which may be needed in the future.
- Elasticity - the ability to scale computing capacity depending on the needs (more or less resource) of companies. Thanks to this, the company pays resources that are useful depending on the needs and requirements (e.g. seasonal fluctuations in production requirements).
- Flexibility – using Cloud technology, companies increase business flexibility by not having bottlenecks (e.g. in peaks). On the other hand, they have the ability to test and develop new services without significant investment.
- Agility – Business in the modern economy requires companies to constantly optimize business processes and costs. Put differently, companies must achieve a high degree of efficiency and effectiveness with a high level of flexibility to remain competitive and be able to adjust to internal and external changes.
- In-house Infrastructure Liability and Costs – possessing own infrastructure generates more costs and represents a significant liability for the company. With the transition to Cloud technology, many obligations/risks are shifted to the cloud service provider, where rights and obligations are defined in the service-level agreements (SLA).
- On-demand self-service – this technology provides service infrastructure on demand, with the possibility to exploit resources scalably where companies do not have to worry about space constraints, processor power, etc.
- Broad network access – access to Cloud technology is possible from anywhere at any time, provided the user has adequate access to the Internet. With the advancement of telecommunication technology, this no longer poses problems in both the fixed telecommunications network segment and the mobile telecommunications network segment.
- Resource pooling – Cloud technology providers possess unlimited capacities of computing resources, most often spread across multiple data centers in various locations, providing greater reliability and economies of scale, thus being able to provide services at significantly lower prices.
- *Measured service* – the resources exploited on Cloud technology can be measured very easily (e.g. storage, processing, bandwidth, and active user accounts) and thus Cloud technology user can optimize their costs, as well as the resources required for the services it uses.
- *Automatic Software/Hardware Upgrades* – having their infrastructure remains a problem for companies that need upgrades at both the hardware and software levels. Applying Cloud technology eliminates the bottlenecks that result from an increase in company requirements, or companies can shift their capital expenses to operating expenses.

The most significant advantages of Cloud technology relate to the following:

- High degree of reliability and scalability,
- Almost unlimited storage,
- Backup and recovery (which can be located in different data centers in different locations / continents),
- Automatic software integration (certain cloud provider services are also the companies offering various software integrated in Cloud technology),
- Quick deployment (getting resources and services in a few minutes),
- Business continuity (being able to provide anywhere at any time).

It is important to emphasize each technology has its advantages and disadvantages, and Cloud technology is no exception (Lakshmi 2014, p. 1-6):

- Access to the cloud depends solely on the Internet access service, which increases the company's dependence on the Internet (because of what is mentioned above, companies may include other links - backup links).
- Cloud provider should represent a stable company with experience and adequate staff, as well as data center to ensure security and avoid failure or lose data, due to some undesired event (e.g. natural disasters, accidents and abuses).
- Releasing data over the Internet poses a risk of theft by tapping the communication line, stealing or corrupting data, or stealing it from disk storage (companies use VPN or MPLS services, or use various types of encryption to secure themselves from data theft).
- Sending and storing data to the cloud can have different legal restrictions, especially if the Cloud provider has data centers outside the country where the data hosting company operates.

Those were merely some of Cloud technology disadvantages, which can be eliminated or reduced if the company undertakes appropriate actions. Therefore, it is crucial for the company to constantly assess them and take actions to reduce or prevent them. It is significant to point out large companies and multinationals already utilizing Cloud technology, and it represents an inevitable future, primarily because of numerous benefits of Cloud technology, many of which are presented in this paper.

One of the main obstacles to more significant deployment of Cloud technology in Bosnian companies is the lack of government support. The government does still not have the strategy for SME development. There is no policy and there are no specific goals for SME development in BiH (Dzafic, 2014). There is also a lack of specific legislation, measures, instruments, and harmonized organizations to support SME development. The lack of coordination between state and entity institutions, and a centralized tax system (used to cover high public costs) are major obstacles to the creation of a framework policy for SMEs. A limited government budget for export promotion programs limits the implementation and efficiency of export promotional activities (Džafic & Omerbasic, 2018).

3.Research method

The research was conducted between February and September 2019, based on online survey including nine research questions (all questions mandatory), primarily relating to top management attitudes and perception regarding cloud technology. The questionnaire was created through Microsoft Forms and distributed via email, Skype, Viber, LinkedIn, and was shared with 387 participants, while only 84 questionnaires were filled in full. The research results were processed in Microsoft Excel and will be presented in graphical form in the paper. The research questions were created on the basis of the following research:

- Haslinda H., Mohd H.M.N., Norhaiza K., Iskandar A. (2017). Factors influencing cloud computing adoption in small and medium enterprises. Journal of ICT, 16, No. 1 (June) 2017, pp: 21–41

- Deloitte (2017). Channeling the Cloud: A Candid Survey of Federal Leaders on the State of Cloud Transformation in 2017.

4.Results and discussion

On the basis of the research results, it can be concluded that a significant number of the respondents belong to the companies with more than 500 employees (38%), or companies with up to 50 employees (30%). A significant number of the respondents work in telecommunication companies (telecom operators or alternative operators primarily operating in the FBiH- 28%), companies from the service (21%) and manufacturing branches (17%).

Graph 1: Industry branch to which your company belongs:

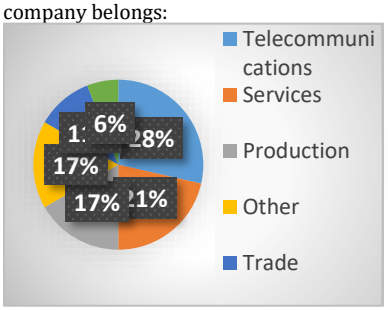
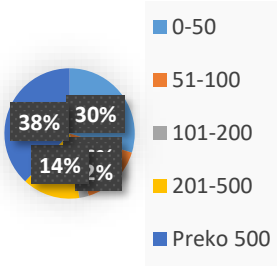


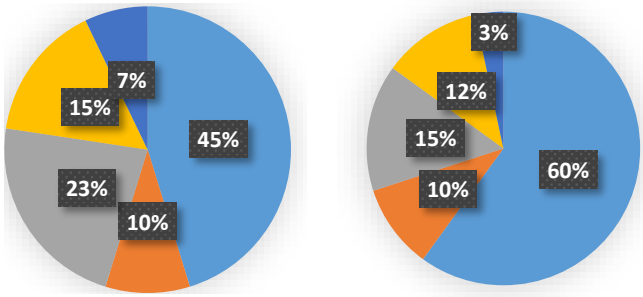
Chart 2: Number of employees in the company:



***Source**: Authors' analysis.*

The results of the survey indicate that very few respondents have fully switched to the cloud – only 3% of them, as stated in Graph 3 (graph on the right). Additionally, 45% of the respondents answered that they did not use cloud services at all. However, if we analyze the research results without including respondents from the telecommunications sector, then we get the information that 2/3 of the respondents do not use cloud services. A significant number of the respondents use cloud as "storage", which is free of charge when using certain e-mail services, such as e-mail services from Microsoft and Google. There is, furthermore, an increased number of users of Office 365, who receive a significant amount of storage on OneDrive as part of the package. Basically, the research results presented in Graph 3 indicate that the vast majority of respondents do not base their business on the cloud, but at the same time there are services migrated to the cloud, primarily referring to the e-mail

Grafikon 3: How would you describe the process of migrating your business to the Cloud?

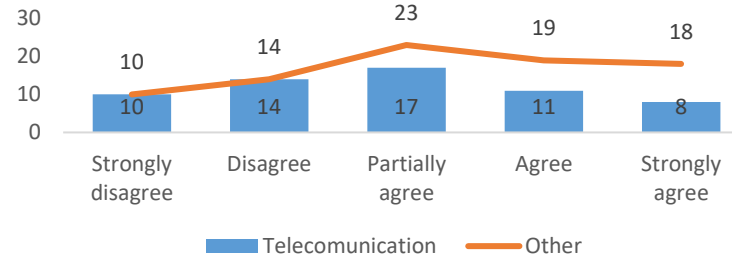


***Source**: Authors' analysis*

Note: The research results presented on the right side do not include the respondents from the telecommunications sector (60 respondents included in the analysis).

A significant number of companies in BiH possess their infrastructure used for primary information systems such as ERP and others. Based on the research results presented in Graph 4, which relates to the question of whether top management plans to invest in cloud computing, the majority of respondents expressed a neutral position. The research results point to the conclusion that company managers do not have enough information and data related to the benefits of Cloud technology, or there are certain barriers that prevent migration to Cloud technology. If we exclude the respondents from the telecommunications sector, then it is possible to conclude that top managers do not plan to invest in the cloud, at all. We believe most of these barriers/reasons are not based on relevant information and real indicators, nor on the experience of companies in the world, who have migrated to the cloud. The switch to Cloud technology would give companies in BiH many benefits presented in the work, which would make the companies more efficient and effective, more competitive, which would certainly affect their business results in the short and long term.

Graph 4: Top management is likely to invest in cloud computing

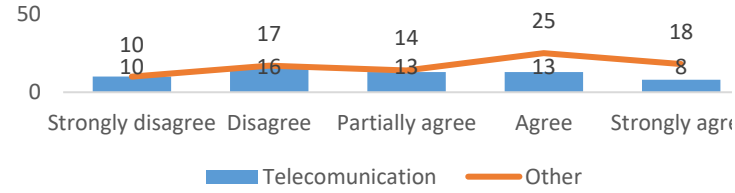


***Source**: Authors' analysis*

Note: The data presented in blue color refers to the results without respondents from the telecommunications sector (60 respondents included in the analysis).

Inadequate information and education of top management influences the perception of Cloud technology. Unfortunately, a significant number of respondents do not think switching to cloud would allow the company to gain a competitive advantage. If we analyze the results of the research, excluding the data of respondents from telecommunications companies, then the percentage of disagreements is increased, i.e. respondents believe Cloud technology cannot influence the increase of competitive advantage. Based on the experience and information available to the authors, it can be concluded that top executives are often not even aware of all the benefits of switching to Cloud technology. They do not have enough information and knowledge to cloud technology. Also, a significant number of BiH companies possess their infrastructure, which is often not implemented according to the regulations and standards that require owning an adequate server room with adequate standards. In this way, the companies are exposed to significant risks related to the possibility of data loss and significant downtime in the event of a malfunction or major problem (e.g, it takes a long time for recovering it to be operational).

Graph 5: Top management is interested in using cloud computing to achieve competitive advantage



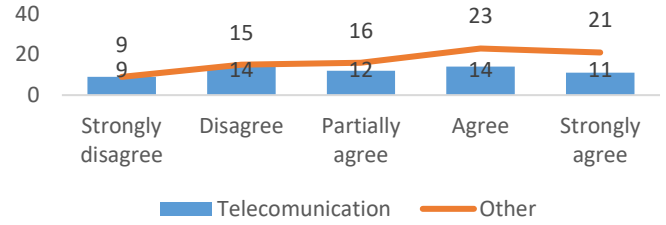
***Source**: Authors' analysis*

Note: The data presented in blue color refers to the results without respondents from the telecommunications sector (60 respondents included in the analysis).

Based on the research results presented in Graph 6, it can be concluded that a significant number of respondents support the implementation of cloud. With an adequate training and analysis of the companies' business by consultants or cloud service providers, the respondents would be willing to consider the option to switch to cloud (probably Public or Hybrid Cloud). However, the results of the research are somewhat different if we analyze only the data with telecommunications sector excluded. We can conclude that respondents from the

telecommunications sector are more familiar with cloud technologies and its benefits benefits, and they expressed a more positive attitude about cloud than respondents from other branches.

Graph 6: Top management supports the implementation of cloud computing

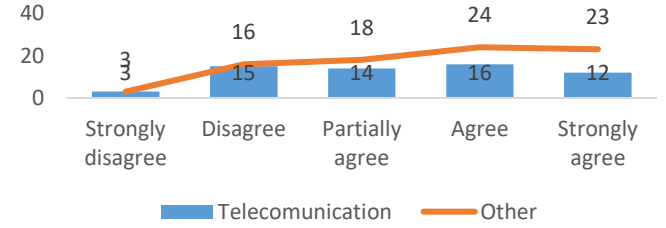


***Source**: Authors' analysis*

Note: The data presented in blue color refers to the results without respondents from the telecommunications sector (60 respondents included in the analysis).

An inadequate level of awareness causes a significant number of top executives to disregard Cloud technology as an opportunity to improve the company's operations. In spite of what is mentioned above, based on the results of the research presented in Graph 7, a significant number of respondents (respondents who answered with 4 and 5) in some way involve it in the processes related to information systems.

Graph 7: Top management provides strong leadership and involvement in the processes related to information systems

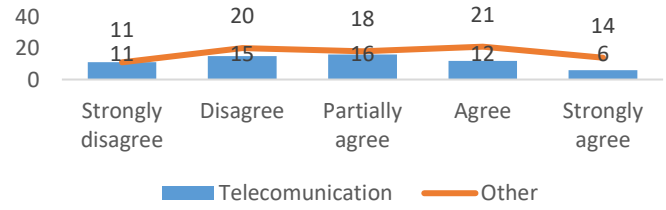


***Source**: Authors' analysis*

Note: The data presented in blue color refers to the results without respondents from the telecommunications sector (60 respondents included in the analysis).

According to the research results presented in Graph 8, the respondents do not share unique attitude in the risk taking segment of the cloud. We believe the research results are primarily a reflection of the respondents' lack of knowledge about the cloud, its benefits and risks. If we analyze the results that exclude respondents from the telecommunications sector, then it can be concluded that top management is not ready to take the risks of using the cloud. The research did not cover the segment of risk knowledge analysis related to migration to the cloud. Moreover, the research did not include the analysis and understanding of the risks assumed if the company does not migrate to the cloud. Increasing awareness and education level about the cloud, we believe the results of the research would be different. Most companies with their servers are, at the same, exposed to higher degree of risk (e.g. loss of data, inadequate degree of flexibility, etc.) than the risks they would be exposed with partial or complete migration to the cloud.

Graph 8: Top management is ready to take the risks related to the cloud computing utilization

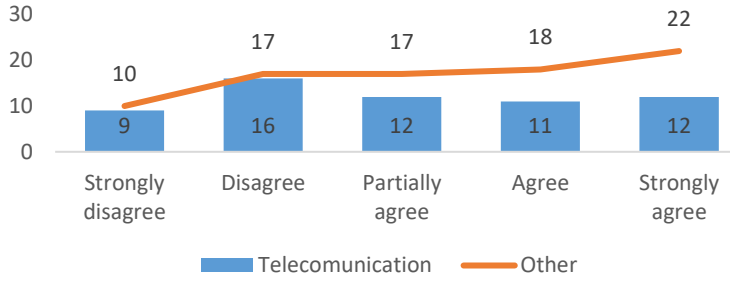


***Source**: Authors' analysis*

Note: The data presented in blue color refers to the results without respondents from the telecommunications sector (60 respondents included in the analysis).

The research results presented in Graph 9 indicate that the respondents do not have attitude regarding the cloud's advantages and strengths, meaning that they do not possess the necessary knowledge in this segment, which was presented in the previous section. Analyzing the current trends in technology implementation in BiH, it is evident that in the near future an increasing number of companies will migrate to the cloud. Especially, in the cases where significant investments are required in the procurement of equipment. Simultaneously, it is possible to see an increase in the cost of employing adequate IT professionals who have the knowledge and experience necessary to implement adequate solutions that involve meeting the short and long-term needs of companies, that in most cases implement a larger number of information systems with a tendency for continuous improvement.

Graph 9: Top management understands the benefits of the cloud computing

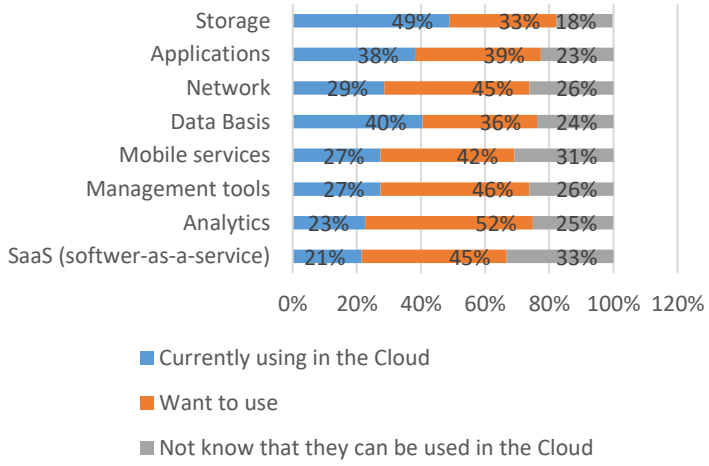


***Source**: Authors' analysis*

Note: The data presented in blue color refers to the results without respondents from the telecommunications sector (60 respondents included in the analysis).

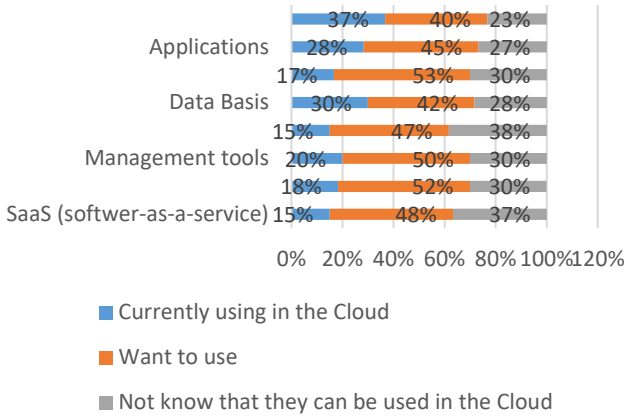
The following graphs will present the research findings pertaining to the perception of the use of Cloud technology for 8 different potential services. The research results reveal that a high percentage of respondents does not use Cloud technology for different services, as shown in the first of the two graphs, with included respondents from the telecommunications sector, and in the second graph, with excluded respondents from the telecommunications sector.

Graph 10: Perception of using Cloud technology



***Source**: Authors' analysis*

Unfortunately, the research results presented in the previous two graphs suggest a significant number of respondents use the cloud primarily as storage or database technology, and there is a great potential and scope for using the cloud. Furthermore, the research results suggest respondents would like to use more cloud services, especially the network, management and analytics tools segment. Unfortunately, based on the research results, we can conclude that there is a high percentage of respondents who do not know that certain services can be used on the cloud.



***Source**: Authors' analysis, research results without respondents from the telecommunications sector (60 respondents included in the analysis)*

According to the presented research results, it is evident that there is significant potential for cloud service providers in BiH. However, an adequate training is required for both decision-makers and other employees, or IT administrators, who would present the advantages and disadvantages of Cloud technology, but also eliminate certain unjustified obstacles and barriers that simultaneously represent the potential for the transition to Cloud technology.

5. Discussion

Based on the presented benefits of Cloud technology, its future use is undeniable not only among companies, but also in other segments such as government and non-governmental institutions. Before a company decides to migrate to the cloud, it is necessary to analyze the actual requirements of the company in terms of business processes, and to improve them to optimize and achieve synergistic effects between business processes, employees and information systems (see more detailed results of a research paper entitled "The improvement of business efficiency through business process management" by Tatić, Haračić, Haračić 2018, p. 32, 37). A detailed analysis and mapping of business processes is necessary to improve and optimize information systems that need to be partially or fully migrated to the cloud. It is important to emphasize the fact that the migration of information systems to the cloud does not imply migration of the "physical" server of the company in terms of specifications, but implies optimizing resource utilization by using resources on the cloud only when it's needed. Thanks to numerous benefits of the cloud, companies can have a flexible and agile approach. Adequate specifying of the genuine needs and their monitoring enables multiple beneficial effects of partially or fully migration to the cloud.

The research results suggest that most companies do not base their business on the cloud, but at the same time, there are indications that certain companies will migrate to the cloud in the future. It is equally necessary to increase the level of information and education of top management regarding the advantages and disadvantages of Cloud technology. We believe this may represent an opportunity for domestic cloud operators who can increase their share of the domestic market, primarily through a greater degree of commitment to individual customers, which is one of the competitive advantages over global cloud providers.

We also believe domestic companies should devote more attention to Cloud technology and plan their business and future investments in the development and improvement of existing and future information systems, especially the cloud, as one of the potential and strategic development guidelines. It is supremely significant to point out the advancement and development of information and telecommunications technology, as well as data collecting, storing and processing remain critical aspect of business decision-making (see more detailed results of the study entitled "The use of business intelligence (BI) in Small and Medium-sized Enterprises" (SMEs) in BiH by Tatić, Džafić, Haračić, Haračić 2018, p. 23-36). We believe that this will be increasingly important in the future, and the loud technology can be a primary platform for collecting, storing and processing data using various tools and systems such as BI (Business Intelligence), ML (Machine Learning) and AI (Artificial Intelligence).

6. Conclusion

Cloud technology has an enormous impact on businesses and the way information systems are used in both small (SME) and large companies. The application of Cloud technology in domestic companies is a relatively new trend that will record a positive degree of utilization in the upcoming years. The companies and decision-makers, primarily top management, do not yet have enough information and data related to the advantages and disadvantages of Cloud technology. This is one of the significant obstacles/barriers to making a strategic migration decision on cloud. It is a matter of time before managers recognize Cloud technology as an opportunity to improve their business and increase their competitive advantage in the market, which will certainly help them become more flexible and agile. Cloud technology is not just a hardware infrastructure, but a platform (hardware and software) that adapts to the users' needs and requirements.

Unfortunately, there is not much research conducted on this specific topic. According to the research results, we can conclude that the managers are not familiar with the potential benefits of Cloud technology, which serves as direct evidence for the hypothesis. However, it is expected that small and large companies will completely or partially switch to Cloud technology in future.

Recommendations for further research refer to the analysis of the key reasons why companies should migrate to the cloud, along with an analysis of the major obstacles and barriers that companies face, as well as the use of modern business decision-making tools such as: BI (Business Intelligence), ML (Machine Learning) and AI (Artificial Intelligence).

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Kasim Tatic is a full professor at the School of Economics and Business, University of Sarajevo, Bosnia and Herzegovina. He is teaching Microeconomics, Managerial Economics, Theory of the firm and Industrial organization, and is a Head of the Microeconomics Chair. He took his master degree in the year 1991 (Faculty of Economics, Belgrade) and received his Ph.D. in the year 2000 (School of Economics and Business, Sarajevo). His interest and research focus are economics of strategy, knowledge management, greening of business models, competitiveness and strategic management, as well as on entrepreneurship, creativity and development of human potentials. He has been lecturer on several international postgraduate and doctoral courses (e.g. "Green Entrepreneurship" module at a doctoral course in Budapest).He has a rich working experience: School of Economics and Business, Sarajevo: Vice Dean and Director of the Center for International Cooperation, Head of Department of School of Economics in Zenica; United States Agency for International Development (USAID), Sarajevo: Project manager on the 270 million US dollars BRFF project on the financing small and medium enterprises (1995-1998); Ministry for Refugees and Social Welfare of Bosnia and Herzegovina: Director of the Agency for Humanitarian Aid (1994-1995); "FONDEKO"- Foundation for Promotion of Sustainable Development and Quality of Life, Sarajevo: Executive Director; "AMAXIMUS" – Association for Development, Creativity and Environment, Sarajevo: leading expert. In the last 35 years he served as a consultant in many organizations and companies; as well as an expert on numerous projects concerning economic issues in Bosnia and Herzegovina (EC Delegation in BH, OECD, UNDP).

Zijad Džafić - Eighteen years of successful academic career. Since February 2017, he was elected Full professor for the scientific field of Economic theory and policy. He completed postgraduate specialization in Italy and stayed at the University of Graz, through the Erasmus program, and study visits to the Universities of Vienna and Leoben in Austria. It focuses on teaching and research in the field of microeconomics and small and medium enterprises. He was vice-dean for research in the period 2010-2014. years. As author or co-author he has published of 5 books and over 70 scientific and professional papers published in recent scientific journals and presented at international and national conferences. He was a mentor and 10 master's theses and 2 doctoral thesis, and leader or team member in eight scientific research project. He is editor of the Proceedings of the some scientific conferences. Currently, He was the chief editor of the Economic Review – Journal of Economic and Business.

Mahir Haračić – completed master's degree in Financial Management, at the School of Economics and Business, University of Sarajevo in 2012, with master thesis entitled Optimization of resources, productivity and business efficiency in an intelligent corporation (emphasis on BPM, ERP and BI). Graduated Cisco CCNA in 2012, and passed a number of exams at Microsoft on Microsoft Nav and Cloud. Author of a number of scientific papers on BPM and BI. Currently employed at BH Telecom, as an Independent Expert Associate for creating communication solutions for legal entities, with seven years of experience in this field. "AMAXIMUS" – Association for Development, Creativity and Environment, Sarajevo: leading expert

Merima Haračić – completed bachelor's degree in English Language and Literature in 2013, at Faculty of Philosophy, University of Sarajevo. In 2014, achieved certificate for a qualified teacher with one year experience as English teacher. In 2016, completed master's degree in Financial Management, at the School of Economics and Business, University of Sarajevo with master thesis entitled: The improvement of Business Efficiency through Business Process Management. Currently employed in Prevent Group (Prevent CEE) as a Supplier Quality Assurance Assistant, with three yeras of experience and one year of experience in Strategic Pruchasing. Participated as a co-author in three articles and one book. "AMAXIMUS" – Association for Development, Creativity and Environment, Sarajevo: leading expert

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Is Coronavirus the worst of the worst for the Human and Earth?

[a] Orhan Özçatalbaş
[a] Akdeniz University, Faculty of Agriculture, Department of Agricultural Economics, Antalaya/Turkey

For the world and the region, where the coronavirus pandemic has visited with so much negativity in 2020, speculation has it that "it's the worst of the worst."

This global pandemic, which has deeply affected our lives with its multifaceted effects, has already begun to question and destroy many customaries and acceptances in our minds. Although there have been devastating global outbreaks in the past, where human losses have reached exceptional numbers, the outreach of media and advancement in information technology has created extraordinary effects in human and social psychology.

If we consider the exaggerated, biased and inaccurate information that bombard our media outlets, we can and should expect it to bring about permanent changes in our worldview, like the effect ocean waves create every time they hit the ocean shore.

This global atmosphere of uncertainty and fear is essentially a precursor sign that nothing will ever be the same again….

- *Let's think! What was on our individual agenda before the coronavirus pandemic? What was on the agenda of our country and counties of our region? So what was on the agenda of countries with strong economic and global military influence?*
- *Let`s think! What agendas did we have before the coronavirus pandemic? What was on the agenda of our countries and our counties? What was the agenda of the economic superpowers with global military influence?*

Undoubtedly, countries had different agendas and goals apart from the havoc threatening global social order and societal governance today.

Regardless of the widespread effect the virus has caused; it is not possible to surmise that all these agendas have suddenly changed.

Questioning the Effect of Corona on the Agenda

Until the global pandemic, local governments and global superpowers had, most of the time, different agendas. On one hand, we were focused on (space) colonizing the Mars, advancing in cybersecurity, technological development work. On the other hand, we inhabited a world where fundamental human rights are violated, a world where there is no respect to the rule of law and people ravaged by poverty exist, left alone in the face of famine, hunger and underdevelopment; a world where, for the survival on the planet, the most plausible conditions are subsistence in drylands. Succinctly, there is starvation rampant in less developed nations with people dying from obesity in more developed countries and an immense discrepancy between economic and social welfare.

Moreover, we have a world doomed to a low level of education, a low standard of living, chaos and internal troubles, and an opposite world which has reached a high level of well-being. However, the hegemonic demands of the world superpowers continue to suppress and brutalize the survivors from these tragedies, and this capital-centered structure has always worked against the economically weak, particularly low-development countries ravaged by civil wars and internal conflicts, shortages of energy and human capital orchestrated by external meddling.

Briefly we have reached a point where; the system is dominated by the advanced and a world that imposes a uniform lifestyle and a hollowed-out world popular culture where human values and social heritage, which are the common heritage of mankind, are put in the background…

Post-Corona Period

These days, the coronavirus pandemic continues to threaten all countries, regardless of whether they are local and global powers. This pandemic that threatens human life is desired; it will result in the disappearance of the understanding of capitalism. It should be noted, however, that this change of understanding is not easy or even impossible.

Received: 16 April 2020; Received in revised from 19 April 2020; Accepted 21 Countries that believe the world is their property and believe that the entire socio-political, economic and military system is under their control globally seem not to allow a world order beyond their control, even if they understand that after the coronavirus, this would not be the case. In fact, when these countries face such a serious wave of global threats, they are expected to question themselves and change their agenda to create new policies.

Consequently, common sense demands that countries, which declare in particular that they advocate the defense of civilization and democracy and that the protection of human rights is their responsibility, but do not fulfil the requirement of this assertion, should, after the global virus epidemic, develop reasonable and virtuous policies that focus on humanity and that are used for the common good of the blue planet and humanity.

Prof. Dr. Orhan ÖZÇATALBAŞ,
Akdeniz University Faculty of Agriculture, Department of Agricultural Economics
Research interests: Rural Development and Extension, Agricultural economics, Rural and Energy Policies, Information technologies

∗ Corresponding author. E-mail address: oozcatalbas@gmail.com (Özçatalbaş). April 2020