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RESEARCH ARTICLE

Development of Import-Based Exports in Turkey: The ARDL Approach

Yaşar Turna[1]

Abstract
Turkey adopted an export-dependent growth strategy after the 1980 liberalization. In later years, with the impact of this strategy, Turkey's export structure and performance became a subject of investigation. Thus, when the export structure is evaluated, dependence of the export oriented industries on capital goods, intermediate goods, and energy is remarkable. Therefore, in this study, the development of import-based exports in Turkey between 1996:1 and 2018:4 was tested by the ARDL bound test method. As a result of the analyses, the effect of intermediate goods, capital goods, and energy imports, which have a higher amount of imports than other imported goods in the short and long term in Turkey, is noteworthy. Hence, the study is important and different from other studies in that it verifies the Turkey's industrial structure tending towards the assembly industry since its recent export structure has shown an import-oriented development and the share of imports of intermediate goods in its exports is high.

Keywords
Export, Import, Energy Import, ARDL Bound Test

Introduction

Since the start of the globalization trend in the world, countries have become closer to each other in terms of having a similar economy. There have been significant changes in the structure of international trade, and the importance and volume of foreign trade have gradually increased. With the increase in foreign trade, the flow of goods and services between countries accelerated and technology began to be transferred from developed to underdeveloped countries. In addition, thanks to international trade, countries have taken advantage of economies of scale, externalities, new product development processes, division of labor, and specialization processes, and they have increased their export potential by achieving effectiveness and efficiency in production as a result of the effective use of the factors of production. Increased export potential has led to specialization in exported goods (Uçak and Arısoy, 2011: 639).

With the globalization trend, developing countries have also adopted the open economy model and tried to adapt their trade channels and economic structures to this model. As a mat-

1 **Corresponding Author:** Yaşar Turna (Lecturer), Pamukkale University, Çivril Atasay Kamer Vocational School, Finance-Banking and Insurance Department Lecturer, Denizli, Turkey. E-mail: yturna@pau.edu.tr Orcid: 0000-0002-3972-9099

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ter of fact, underdeveloped countries that want to increase their export potential in accordance with the open economy model, while trying to increase their production amount, product variety, and competitiveness, have also become dependent on intermediate and capital goods. Therefore, with the removal of the obstacles to international trade, their dependence on imported goods has increased because underdeveloped countries that want to complete their development and gain profit from international competition import these goods from developed countries that specialize in the production of many goods and have a say in their export. Thus, the use of significant amounts of imported inputs in the production of export products further increases the dependency level of countries (Ersungur et al., 2011: 1-3).

Another factor affecting the foreign dependency of countries is the changes in exchange rates. Decreases in the exchange rate as a result of the overvaluation of the domestic currency, increase the use of imported goods in the country and the dependence on imports (İnançlı and Konak, 2011: 344-347). Therefore, in general, when the reasons that increase the foreign dependency of developed or underdeveloped countries are evaluated, the following factors come to the fore: changes in the exchange rate, unstable economy, overvalued currency, high costs, high costs of imported inputs, and high share of use of imported goods within the country.

When the foreign trade structure of Turkey's economy is evaluated based on the statements made, it can be said that liberal economic policies were adopted between 1950 and 1960 and import substitution industrial policies between 1960 and 1980 (Gerni et al., 2008: 2). With the effect of the oil crisis in the 1970s, Turkey experienced high inflation and currency problems, and as a result of these problems, it transformed its economy in 1980 and introduced an export-oriented industrialization strategy. With this strategy, Turkey started some efforts to increase its exports and adopted an export promotion policy. With the effect of liberalization in foreign trade, the rate of exports in the country's economy gradually increased. As a result of the Customs Union Agreement made with the European Union in 1994 and the common tariff in trade with member countries, which started to be implemented in 2005, Turkey's foreign trade potential increased more than in previous periods. However, its foreign trade deficits and dependency on imports did not decrease. Also in Turkey, with increasing external funding opportunities due to increased foreign capital inflows, an increasing amount of foreign currency, and the increase in the value of the Turkish lira, an increase was observed in domestic demand and imports. Therefore, the number of imported inputs used in production increased with increasing imports, and this negatively affected the production of intermediate goods in the domestic market. As a result of this, from the 2000's to 2010's, imports of intermediate goods, including energy imports, almost doubled. As a matter of fact, it was observed that imports increased faster than exports. During this period, the ratio of exports to imports was around 65%. This situation is explained by the fact that the manufacturing industry of the country was increasingly dependent on imported inputs. While import dependency in the economy gradually increased in Turkey, the ninth and tenth development

plans were launched in 2007 and 2014, respectively, to increase the export potential, reduce the import dependency of export-oriented industries, increase the total factor productivity in exporting sectors, and enhance the international competitiveness (Çelik, 2016: 110-112). However, despite the incentive and aid policies implemented, foreign trade deficits have become a chronic problem. Therefore, the implemented policies continue to be discussed today. The reason for this debate is that exports are dependent on imports, and this dependency is gradually increasing (Yıldırım and Kesikoğlu, 2012: 137). In addition, due to the lack of qualitative depth in goods and services subject to import and export, despite the increase in foreign trade volume, the expected structural transformation could not be fully realized. In other words, while goods produced for export have a low added value, the imported goods are mostly capital- and technology-intensive goods. Therefore, importing intermediate and capital goods, which are subject to export and real sector inputs, increases foreign trade deficits and dependence on imports (Karakaş, 2017: 261-263). For this reason, based on the explanations made especially recently, identifying Turkey's level of import dependency of exports is important. The fact that Turkey has an economic growth based on exports makes it necessary to investigate the structure and components of its exports.

Literature

In Turkey, with the realized stabilization measures and liberalization policies in 1980, significant changes have been achieved in the foreign trade. As a result of this situation, Turkey tried to increase its number of exports with incentive policies. However, the increase in the number of exports has also affected the use of imported goods in the economy. Recently, the number of studies on the dependence of exports on imports has increased in the literature. But the studies differ from each other in terms of the results obtained. Esfahani (1991) analyzed the relationships between exports, intermediate imports, and economic growth in developing countries and found a positive relationship between exports and economic growth. However, it was reported that this relationship deteriorated when the intermediate imports were included in the model. As a result, a meaningful relationship was reported to be established between imports and economic growth. Lee (1995) tested whether there was a significant relationship between imports of capital goods and economic growth in developing countries. Adams (2000) examined the relationship between energy imports and economic growth in Thailand and reached the conclusion that energy imports increased rapidly during the economic growth process. Arize (2002) examined the relationship between imports and exports in 50 countries and concluded that 57% of low-income countries, 58% of developing countries, and 75% of developed countries were dependent on imports. It was also reported that as the development levels of the countries increased, the dependence of exports on imports increased. Pavlos (2004) examined the relationship between intermediate imports, capital goods imports, and economic growth in Ethiopia and reported that there was a positive cor-

relation between imports of intermediate goods and economic growth, and a negative relationship between imports of capital goods and economic growth. Bojnec and Popler (2011) tested the relationship between economic efficiency and energy consumption in their studies. As a result of the study, it was found that technology-intensive production in exports reduced energy consumption in the economy. Bojnec and Ferto (2014) examined the relationship between foreign direct investments and exports in OECD countries and concluded that there was a substitution effect between foreign direct investments and exports. According to this, it was asserted that, instead of exporting the goods of OECD countries that are members of the European Union, they followed a strategy to substitute exports by investing directly in that country. Udemba et al. (2020) tested the relationship between foreign direct investments, tourism revenues, energy consumption, and economic growth in China and concluded that there was a one-way relationship between economic growth and energy consumption. In the studies carried out outside Turkey, economic growth was often used in the analysis for testing the relationship between imports and exports.

There are also some studies in Turkey that mostly test the export-based growth hypothesis. For example, in the studies by Özcan and Özçelebi (2013), Saraç (2013), and Uçan and Koçalı (2014), the validity of export-led growth hypothesis in Turkey was tested and found to be valid. Unlike the export-led growth hypothesis, in the studies by Çeştepe (2013), Korkmaz and Aydın (2015), it was claimed that an import-driven growth hypothesis was valid. In addition, it is noteworthy that there are more specific studies where Turkey's exports based on imports were analyzed. Barışık and Demircioğlu (2006) studied the relationship between exchange rate, exports, and imports in Turkey. In their studies, they concluded that in the post-convertibility period, the effects of import and exchange rates on exports gradually decreased. In their study, Ersungur and Kızıltan (2010) used the input-output method for the sector in Turkey and measured the dependence of the manufacturing industry on imports. Accordingly, they concluded that, both in the import substitution period and liberalization period, Turkey's manufacturing industry was dependent on imports. Ersungur et al. (2011) tested the degree of dependence on imports in Turkey using the input-output analysis and found that the increases in exports increased the capacity utilization by increasing the imports of intermediate goods, rather than creating new investments, and this negatively affected the external deficit. They also found that the capacity utilization and energy dependency of the manufacturing industry were high in Turkey. In their study, İnançlı and Konak (2011) used the input-output tables prepared by the Turkish Statistical Institute (TurkStat) to examine the input dependence of the automobile industry and reported that the dependency level of exports on imports increased in the sectors linked to the automobile industry. Yildirim and Kesikoglu (2012) tested the causal relationship between import, export, and real exchange rate in Turkey. As a result of the study, a two-way causality relationship was found between total exports and total imports, total exports and intermediate goods imports, total exports and capital goods imports, total imports

and consumption goods exports, and capital goods imports and consumption goods exports. No causality relationship was found between exchange rate, import, and export. Magazzino (2016) tested the relationship between carbon dioxide emissions, economic growth, and energy consumption in South Caucasus and Turkey and concluded that there was no relationship between energy consumption and economic growth and claimed that the neutrality hypothesis was valid. Karakas (2017) examined the export and import relations between the EU countries and Turkey. As a result of the study, it was found that the consumption goods exports (around 45% of total exports) depended on total imports and intermediate goods imports. When the studies carried out in Turkey are evaluated, it is observed that, in general, there is no consensus on export-led growth strategy. The number of studies testing the dependence of exports on imports is very small. In the studies testing this relationship, no distinction was made between short and long term. It is observed that although energy consumption has an important effect on Turkey's import dependency, it has not been included in the studies or its effect has been reported to be insignificant. It is also observed that the exchange rate has been mostly used in the studies. Therefore, this study includes short and long term analysis, unlike the studies in the literature. This study differs from others in that it uses up-to-date data; the analysis includes energy imports, which have recently been included as an input in production function definitions, in which Turkey's dependency is high, and which have a positive effect on exports; and it explains import dependency more clearly.

Econometric Methodology

Various econometric methods are used to test the long and short term relationships between the variables subject to economic analysis. Among these, the delayed ARDL (Autoregressive Distributed Lag), which was recently introduced by Pesaran and Shin (1998), differs from other analysis methods. While classical cointegration tests require the variables to be stationary at the same level, according to the ARDL model, it is not important whether the variables are stationary at the level [I (0)] or [I (1)] (Sharifi-Renani, 2008: 4). However, the ARDL model cannot be applied if the variables are stationary at the level [I (0)] or difference [I (1)] and not stationary at the 2nd difference [I (2)] (Çağlayan, 2006: 427). This feature differentiates the ARDL model from other cointegration tests. The ARDL model is based on the least squares method and its application to small samples provides important advantages. Another advantage of the model is that it provides the opportunity to separate short and long term analysis. The ARDL model is shown as follows.

$$lnY_t = \beta_0 + \sum_{i=1}^{k} \beta_{1i}\, \Delta lnY_{t-i} + \sum_{i=0}^{k} \beta_{2i}\, \Delta lnX_{t-i} + \sum_{i=0}^{k} \beta_{3i}\, \Delta lnX_{2t-i} + \sum_{i=0}^{k} \beta_{4i}\, \Delta lnX_{3t-i} + \varepsilon_t$$

The values of k in the model indicate the length of the delay, and Δ the difference of the variables. In order to determine the appropriate delay length in the defined equations, the most appropriate delay length is obtained by using information criteria such as Akaike and Schwarz. After determining the lag length, the following hypothesis tests are used to test the cointegration relationship between the variables.

H_0: $\beta_1=\beta_2=\beta_3=\beta_4=0\rightarrow$ There is no cointegration.

H_1: $\beta_1\neq\beta_2\neq\beta_3\neq\beta_4\neq0\rightarrow$ There is cointegration.

The hypothesis tests defined in the form are tested using the F test. (Narayan, 2005:1981). If the F test results are above the critical value, there is a cointegration relationship between the variables, that is, the H_0 hypothesis is rejected. The dynamic unconstrained error correction model can be obtained with the help of simple linear conversion from the ARDL model. Thanks to the UECM (Unrestricted Error Correction Term) used in the model, the ARDL model gives better statistical results than the Engle-Granger test (Narayan and Narayan, 2005:429). The unconstrained error correction model obtained from the ARDL model is as follows:

$$\Delta lnY_t=\beta_0+\sum_{i=1}^{m} lnY_{t-i}+\sum_{i=0}^{k}\beta_{1i}\,\Delta lnX_{t-i}+\sum_{i=0}^{k}\beta_{2i}\,\Delta lnX_{2t-i}+\sum_{i=0}^{k}\beta_{3i}\,\Delta lnX_{3t-i}+ECT_{t-1}+\varepsilon_t$$

In the given model, ECT_{t-1} refers to the error correction term. Accordingly, the error correction term takes a value between -1 and 0. The term error correction is important in terms of showing how much of any deviation effect occurring in the short term can be eliminated in the long term.

Data Set and Application

This study investigated the exports based on imports between 1996Q1 and 2018Q4 in Turkey. The ARDL model and Error Correction Model used in the study are given in the equations (1) and (2), respectively.

$$lnM\dot{I}H_t=\beta_0+\sum_{i=1}^{k}\beta_{1i}\,\Delta lnM\dot{I}H_{t-i}+\sum_{i=0}^{k}\beta_{2i}\,\Delta lnSER\dot{I}TH_{t-i}+\sum_{i=0}^{k}\beta_{3i}\,\Delta lnARA\dot{I}TH_{2t-i}+\sum_{i=0}^{k}\beta_{4i}\,\Delta lnEN\dot{I}TH_{3t-i}+\sum_{i=0}^{k}\beta_{5i}\,\Delta lnDK_{4t-i}+\varepsilon_t \quad (1)$$

$$lnM\dot{I}H_t=\beta_0+\sum_{i=1}^{k}\beta_{1i}\,\Delta lnM\dot{I}H_{t-i}+\sum_{i=0}^{k}\beta_{2i}\,\Delta lnSER\dot{I}TH_{t-i}+\sum_{i=0}^{k}\beta_{3i}\,\Delta lnARA\dot{I}TH_{2t-i}+\sum_{i=0}^{k}\beta_{4i}\,\Delta lnEN\dot{I}TH_{3t-i}+\sum_{i=0}^{k}\beta_{5i}\,\Delta lnDK_{4t-i}+ECT_{t-1}+\varepsilon_t \quad (2)$$

The definitions of the variables used in the model in the equation (1) are given in Table 1.

Table 1
Definitions of Variable

Abbreviations	Description	Source
LnMİH	Exports of goods (Thousand USD dollars)	CBRT
LnSERİTH	Capital goods import(Thousand USD dollars)	CBRT
LnARAİTH	Import of intermediate goods (Thousand USD dollars)	CBRT
LnENİTH	Net energy import (Thousand USD dollars)	CBRT
DK	Exchange rate (USD)	CBRT

The data used in the study were obtained from the CBRT EVDS database. The dependent and independent variables used in the model were included in the model by taking the logarithm. Descriptive statistics calculated for the variables in the model are given in Table 2.

Table 2
Exploratory data analyses

Variables	Mean	Median	SD	Skewness	Kurtosis
ΔlnMİH	9.918656	10.18106	0.677553	-0.413532	1.516506
ΔlnSERİTH	7.395768	7.586021	0.584379	-0.474415	1.846834
ΔlnARAİTH	8.829108	9.083403	0.721379	-0.389707	1.531917
ΔlnENİTH	8.430158	8.695251	0.833199	-0.405605	1.785858
ΔDK	1.623810	1.476277	1.111874	1.231367	5.194718

As a result of the analysis, unit root tests were applied to show the stationarity levels of the series in order to prevent the spurious regression problem. Standard unit root tests such as Augmented Dickey Fuller, Dickey-Fuller GLS (ERS), Philips Perron, and Kwiatkowski-Phillips-Schmidt-Shin were used in the analysis. Accordingly, standard unit root test results are given in Table 3.

Table 3
Unit root test results

Variables	ADF		Dickey-Fuller GLS	
	Level I(0)	Difference I(1)	Level I(0)	Difference I(1)
ΔlnMİH	-1.0663	-5.4845***	0.0962	-6.2068***
ΔlnSERİTH	-1.2485	-4.4229***	-0.6825	-0.2059
ΔlnARAİTH	-1.2939	-7.9486***	0.1552	-7.8223***
ΔlnENİTH	-1.6747	-5.9000***	-0.7368	-5.9347***
ΔDK	-3.1971**	-------	-4.5248***	------
Variables	**PP**		**KPSS**	
	Level I(0)	**Difference I(1)**	**Level I(0)**	**Difference I(1)**
ΔlnMİH	-1.4198	-10.7447***	1.1550	0.2772***
ΔlnSERİTH	-1.7969	-16.2129***	1.0756	0.2233***
ΔlnARAİTH	-1.3032	-7.8194***	1.1378	0.1472***
ΔlnENİTH	-1.6977	-5.6973***	1.0482	0.3547**
ΔDK	2.9044	-7.3201***	1.0554	0.5497*

***,**,* The marks represent significance at the level of 1%, 5%, and 10%, respectively.

For unit root tests in Table 3, according to the null hypothesis, variables contain unit root; and according to the alternative hypothesis, variables do not contain unit root. As a result of unit root tests, exports of goods, intermediate goods, capital goods and energy imports are stationary in difference. According to the ADF and Dickey-Fuller GLS tests, the exchange rate series is stationary in level. But according to the PP and KPSS test results, it was stationary in difference.

According to the unit root tests performed, although the stationarity degrees of the series varied in some tests, it was observed that they were stationary at the I (0) and I (1) levels, and the ARDL test, which can be used when the series are at different stationarity levels, was applied. Thus, the ARDL test results are given in Table 4.

Table 4
ARDL Bounds test results

F Statistic	**15.61671*** **	
Significance level	**Lower limit**	**Upper limit**
1%	3.29	4.37
2.5%	2.88	3.87
5%	2.56	3.49
10%	2.20	3.09

***,**,* The marks represent significance at the level of 1%, 5%, and 10%, respectively.

As can be seen in Table 4, the obtained F statistic value (15.61671) is greater than the F critical value (4.37). According to this result, the null hypothesis (H_0: There is no cointegration relationship between the variables) is rejected. Therefore, there is a cointegration relationship between exports and capital goods, intermediate goods, energy consumption, and exchange rate in the long and short term. However, in order for the cointegration test to be valid, the model should not have autocorrelation, heteroscedasticity, and normal distribution problems. Robustness tests for the validity of the model are included in Table 5.

Table 5
Robustness checks results

Test	**F statistics**	**Probability**
Breusch-Godfrey LM test	1.045950	0.3100
White test	0.661856	0.8208
Jarque Bera test	1.276856	0.5281
R-squared	0.507193	----

According to the results of Breusch-Godfrey, White, and Jarque Bera tests in Table 5, no problems regarding autocorrelation, heteroskedasticity and normal distribution were observed in the model. Therefore, the long and short term relationships between variables are valid. The coefficients showing the long-term relationship between variables are included in Table 6.

Table 6
ARDL Long term coefficients

Variables	Coefficients	Standard errors	T statistics
LnARAİTH	0.5147	0.1550	3.3204***
LnSERİTH	0.2306	0.0984	2.3439**
LnENİTH	0.1598	0.0796	2.0074**
DK	0.0525	0.0206	2.5412**
C	2.2516	0.2724	8.2638***

***,**,* The marks represent significance at the level of 1%, 5%, and 10%, respectively.

Coefficients showing the long-term relationship between variables are given in Table 6. According to the analysis results, the import of intermediate goods is at the significance level of 1%. Capital goods, energy imports, and exchange rate represent statistically valid results at the significance level of 5%. According to the results of long-term coefficient estimates, imports of intermediate goods and capital goods, energy imports, and changes in exchange rates affect the exports of goods. Accordingly, a 1% increase in intermediate goods imports increases the exports of goods by 0.5147. A 1% increase in capital goods imports increases the exports of goods by 0.2306. A 1% increase in energy imports increases the exports of goods by 0.1598. A 1-unit increase in the exchange rate increases the exports of goods by 0.05. The coefficients based on error correction model showing the short-term relationship between variables are included in Table 7.

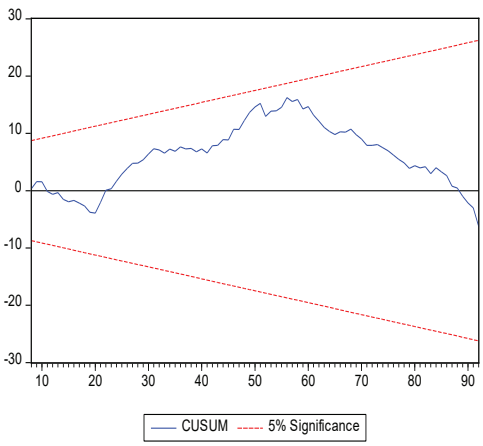
Table 7
ARDL Short term coefficients

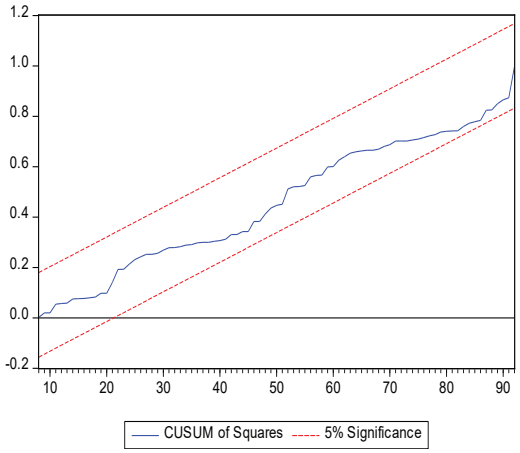
Variables	Coefficients	Standard errors	T statistics
LMİH(-1)	-0.5003	0.0592	-8.4394***
LARAİTH	0,2575	0.0908	2.8341***
LSERİTH	0.1154	0.0465	2,4817**
LENİTH	0.0799	0.0390	2.0502**
DK	0.0262	0.0110	2.3892**
SABİT	1.1265	0.1892	5.9518***
ECT(-1)	-0.5003	0.0502	-9.9605***

***,**,* The marks represent significance at the level of 1%, 5% and 10%, respectively.

According to the short-term coefficient estimation results, imports of intermediate goods and capital goods, energy imports, and changes in exchange rates affect the exports of goods. Accordingly, a 1% increase in intermediate goods imports increases the exports of goods by 0.2575. A 1% increase in imports of capital goods increases the exports of goods by 0.1154. A 1% increase in the energy imports increases the exports of goods by 0.0799. A 1-unit increase in the exchange rate increases the exports of goods by 0.0262. Also, the error correction term indicates statistically significant results. Accordingly, 50% of the short term shocks are eliminated in the long term. The CUSUM test results obtained as a result of the ARDL test are shown in Table 8.

Table 8
CUSUM- CUSUMQ graphs





According to the CUSUM and CUSUMQ graphs, the model is observed to be stable.

Conclusion and Recommendations

In this study where the exports based on imports in Turkey were investigated using the quarterly data for 1996-2018 obtained from the database of CBRT, the long-term and short-term relationships between the imported inputs, which significantly affect the export of goods in Turkey, were tested by the ARDL method.

When the test results are evaluated, according to the long-term coefficient estimation results, the changes in the intermediate goods imports, capital goods imports, energy imports and exchange rates affect the exports of goods. Accordingly, a 1% increase in the imports of intermediate goods increases the exports of goods by 0.5147. A 1% increase in the imports of capital goods increases the goods exports by 0.2306, a 1% increase in the energy imports increases the goods exports by 0.1598, and a 1% increase in the exchange rates increases the goods exports by 0.05. A 1% increase in the imports of capital goods increases the goods exports by 0.2306, a 1% increase in the energy imports increases the goods exports by 0.1598, and a 1% increase in the exchange rates increases the goods exports by 0.05. In addition, when the short-term coefficient estimation results are evaluated, imports of intermediate goods, capital goods imports, energy imports, and changes in exchange rates affect the exports of goods. Accordingly, a 1% increase in the imports of intermediate goods increases the exports of goods by 0.2575. A 1% increase in the imports of capital goods increases the goods exports by 0.1154, a 1% increase in the energy imports increases the goods exports by 0.0799, and a 1% increase in the exchange rates increases the goods exports by 0.0262.

According to these findings, Turkey's exports of goods, intermediate goods, capital, and energy imports are affected by the changes in exchange rates in the short and long term. The reason for the higher effect of intermediate imports on exports compared to other variables used in the study may be the fact that Turkey's export sector operates mostly for the assembly industry. The short and long term coefficients obtained from the analysis show that the effect of variables on exports is more powerful in the long run. This can be interpreted as that exports consist of more capital-intensive goods than labor-intensive ones. It is noteworthy that, in the literature, the studies on the export and import in Turkey generally included the exchange rate in the analysis. However, in this study, it was observed that the effect of exchange rate on recent exports was relatively low. This can be put forward as one of the reasons for the insufficient increase in the export volumes despite the increases in exchange rates. Although the impact of energy use on economic growth is debated in the literature, considering the use of energy as input in the production of export goods and the impact of exports on economic growth, it can be inferred that energy imports indirectly contribute to economic growth.

According to this assessment, in order to close the current account deficit and the trade deficit, ensure a stable foreign trade structure, and increase its share in the international competition, Turkey should reduce its import dependency and ensure the domestic production of intermediate goods that are not produced domestically. In addition, increasing the efforts to encourage domestic capital, transfer of capital to production and exporting sectors will reduce imports of capital goods and gradually reduce the dependence on capital goods. In addition, although the effect of the exchange rate on exports is relatively low, fluctuations in trade can be prevented through a stable exchange rate policy. Thus, industries that are export-oriented but dependent on imports can have a stable production structure by avoiding cost changes and cost shocks. In order to provide cost advantages and reduce import dependency in exporting sectors, Turkey should encourage the technology-intensive production structure in industries that produce for export, and by doing so, provide competition and cost advantage in exports by reducing the amount of imported inputs and energy consumption.

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RESEARCH ARTICLE

Comparison of Forecasting Performance of ARIMA LSTM and HYBRID Models for The Sales Volume Budget of a Manufacturing Enterprise*

Ayşe Soy Temür[1], **Şule Yıldız**[2]

Abstract

This study aims to create a monthly sales quantity budget by making use of the previous income data of an enterprise operating within the construction sector, which is considered the locomotive of the economy. For estimating time-series of sales as a linear model *ARIMA (Auto-Regressive Integrated Moving Average)*, as nonlinear model *LSTM (Long Short-Term Memory)* and a *HYBRID (LSTM and ARIMA)* model built to improve system performance compared to a single model was used. As a result of the study, *Mean Square Error (MSE)*, *Root Mean Square Error (RMSE), Mean Absolute Percentage Error (MAPE)* and *Mean Absolute Error (MAE)* values obtained from each of the methods used in the application were compared, and a monthly sales volume budget was created for 2017 with all the methods used. When the *MAPE* and *MSE* values obtained from each of these methods were compared, the best performance was the *Hybrid* model that gave the lowest error, and in addition, the fact that all of the application models got very realistic results by using the historical data showed the success of the predictions..

Keywords

Sales Budget, Time Series Forecast, Hybrid Model, ARIMA, LSTM

Introduction

The construction sector is considered the “locomotive of the economy” because it affects the demand for goods and services produced by many sub-sectors connected to it. Also, due to its contribution to employment and its relationship with other sectors, it performs a fundamental role in achieving and maintaining the economic growth rate desired to be achieved (Kılıç & Demirbaş, 2012).

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Economic uncertainties are the most critical elements affecting demand in the construction industry. In some periods, suppressing the demand in the sector or disrupting the continuity in manufacturing also has a diminishing effect on fixed capital investments in the sector. This situation causes producers to stay away from fixed capital investments and keep their assets liquid at all times. The contraction of the construction sector may cause the sub-industries producing construction materials to be forced to work at low capacity in this period. This adverse process also impacts the manufacturing industry, the national economy, and as a result, employment (Düzyol, 1997). Due to these disadvantages, businesses want to predict the future to compete in increasingly competitive conditions and to adapt to the continually changing world. Therefore, demand forecasting is one of the critical tools that businesses will use to attain their short- and long-term goals. With a good forecast, future uncertainties are reduced. The achievement of this depends on the effective establishment and operation of the forecasting system.

As a result of the estimations made, the operating budget consisting of management plans related to the activities of the companies for the future periods is prepared. These budgets show the resources that businesses need to achieve their goals, how these resources will be obtained and where they will be used. Although there are exceptions, sales budgets form the basis of the budget system in businesses. Forecasting sales for the next period is significant for a sound budget system and therefore a reasonable sales budget.

The methods used in sales forecasting are generally divided into two groups as traditional and advanced methods. Methods based on expert opinions and personal experiences are expressed as traditional methods, while methods based on statistical and mathematical data are referred to as advanced methods.

The set of values observed at regular time intervals and consecutive time periods are expressed as time-series. The techniques of forming estimates and policies regarding the values that may occur in the future with the use of the data that emerged in the past are time-series analyses. The primary purpose of time-series analysis is to develop a mathematical model based on available data. Due to the difficulty in evaluating the precise nature of a time-series, it is often challenging to produce appropriate predictions. (Khandelwal, Adhikari, & Verma, 2015). There are several methods in time-series analysis, and each method has several advantages and disadvantages. One of the most significant benefits of time-series methods is their ability to solve problems where the data set, which is very complicated for traditional technologies, is not linear, missing or multidimensional. (Yılmazel, Afşar, & Yılmazel, 2018). Because of these advantages, time-series are frequently used in forecasting.

The reliability of demand forecasting methods is the essential factor in the success of that method. Whether the method is successful or not is determined by comparing the estimated results obtained with the actual values. The fact that the difference between the predictions made and the values emerging starts to open means that it gives a critical alarm that the pre-

dicted environment has changed. Considering the fast consumption sector, following the demand trend in this sector and the positioning of the products according to these estimates will enable both the customers to find the product they are looking for and to not make incomplete or excessive stocks. Also, it will provide various benefits such as making the budget right, managing the cash flow correctly and not missing out on opportunities (Ahmetoğlu, 2018).

Many methods that can be called linear, nonlinear and hybrid methods have been developed to increase the accuracy of predictions. Linear methods establish a linear relationship between observed data points and future data points. The ARIMA model from linear methods and artificial intelligence-based models from nonlinear methods have been used frequently in demand forecasting in recent years. ARIMA, which is one of the linear statistical methods, has been used in many applications in relevant literature. This method used in stationary time-series is used to deduce the factors in the time-series.

The Artificial Neural Networks (ANN) method has many important features such as generalization, working with an unlimited number of variables, and learning from data. Providing important benefits due to these features, ANN stands out as an effective demand forecasting technique. ANN is similar to qualitative methods in terms of learning the relationship and degrees between factors, and quantitative methods in terms of using statistical data. But people do not learn new meanings for every word they have just learned. Based on similar words that existed earlier, they add meaning to the word they just learned. The biggest deficiency of traditional ANNs is the absence of this meaningful attribute present in humans. Repetitive ANN (RNN), on the other hand, creates a loop and enables the use of historical information, so that it can classify by making meaningful connections between the frames. In this sense, RNNs make up for this shortcoming in traditional ANNs (Olah, 2015).

RNNs can make sense of events that occur sequentially, as they can form a loop. Due to this advantage, they are widely used in many areas such as language modeling, translation, image captioning, speech recognition, etc. in recent years. However, although RNNs give successful results in some problems thanks to their connection with the past and their interpretation features, some situations such as which activities to remember, and how long to remember, are not known (Bengio, et al., 2015). While some information is important for activities, some information may be unnecessary. Therefore, there is no need to save the entire history. In the classification phase, this information may not be available if the information needed has already been created. Therefore, RNNs need a different architectural structure to predict previous events. In such problems, Long Short-Term Memory (LSTM) networks are used that work better and can learn a particular type of RNN and long-term dependencies. (Olah, 2015). Unlike RNN, "Vanishing gradient" problem that may arise during training can be solved with LSTM. For this reason, LSTMs are generally preferred in many activity classifications. The use of LSTMs in the vast majority of successful studies with RNNs in recent years is an indication of this situation.

Both linear and nonlinear methods are not suitable universal models that can be used in all conditions. For this reason, in the literature, "hybrid" methods are also used, which combine the advantages of more than one individual model to overcome this limitation and increase the performance of the forecast. The idea behind hybrid models is that each unique method in hybrid methods is used to capture different prediction models. For example, in the case where a time-series includes both linear and non-linear models at the same time interval, neither linear nor nonlinear models alone are sufficient. For this reason, hybrid models may have been created by combining homogeneous, i.e. differently configured neural networks or heterogeneous, i.e., linear and non-linear models. Models that combine ARIMA with ANN are an excellent example of a hybrid model. While ANN is concerned with non-linear models in such hybrid models, the ARIMA model is concerned with linear models.

In this study, ARIMA was preferred as it is a linear model for sales prediction frequently used in social sciences, and LSTM, which makes up for the deficiencies of RNN as a nonlinear model, and which has widely been used in recent years, was preferred. The application of the same data to more models rather than a single model can increase the accuracy of the estimation. Therefore, a hybrid model was created to overcome the limitations of LSTM and ARIMA models. As the data set, 96 monthly sales data of an enterprise operating in the construction sector in the period between 01.2010 and 12.2017 were used.

The primary purpose of the study was to produce accurate predictions about future periods by using the data of the previous period, regardless of the method used. Therefore, analyses were conducted firstly with the ARIMA model, secondly with the LSTM model and lastly with a hybrid model which was created by combining the advantages of the two models as mentioned above. The results obtained from all of the methods were compared with each other and with real values. With this study, it was aimed both to benefit the company in making future production and sales plans by predicting the sales at a decent and minimum error level, and to contribute to the literature in terms of similar studies to be carried out from now on.

The study consists of a total of three parts, apart from the introduction and conclusion. The first part of our research is the literature section and it includes specific examples of projects which used ARIMA, LSTM and some Hybrid models. The second section describes the methodology used to create predictions. In the third and last section, the methods adopted in the analysis are explained and the findings obtained from the analysis results are included.

Literature Review

ARIMA models in the literature have been applied to predict future values of various time-series data such as wind speeds, global temperature values, water quality, housing prices, electricity prices, sugar prices, sales data, stock market data. The popularity of these models is due to their statistical properties as well as their dependence on the Box-Jenkins metho-

dology. These models can help understand the dynamics of data in a particular application (Smith, 2018).

On the other hand, LSTM networks are used mostly for more in-depth learning and achieve greater success with large data sets. However, though limited in number, examples of LSTM being trained with few data sets are also available in the literature. For instance, Namın and Namın (2018) succeeded in estimating the economic and financial time-series they performed using an LSTM network model with an error margin of 13% -16% (Namın & Namın, 2018).

In recent years, it has been suggested that hybrid methods created especially by combining the benefits of models give much better results compared to the methods used alone. Some of the studies on hybrid models that combine the advantages of two or more individual models in the literature can be summarized as below.

Wedding and Cios (1996) presented a methodology integrated with radial-based function networks and Box-Jenkins ARIMA models (Wedding & Cios, 1996). Luxhoj et al. (1996) estimated the 24-month total sales of a firm using the hybrid econometric neural network approach (Luxhoj, Riis, & Stensballe, 1996). Tsaih et al. (1998) combined rule-based systems and hybrid artificial intelligence methods to predict the daily price change direction of the S&P 500 Stock Index (Tsaih, Hsu, & Lai, 1998).

Tseng et al. (2002) proposed a hybrid model consisting of a combination of seasonal ARIMA and a neural network back propagation algorithm (BP) known as SARIMABP (Tseng, Yu, & Tzeng, 2002). In his study of time-series forecasting using the ARIMA and ANN hybrid model, Zhang (2003) used Wolf's sunspot, Canadian lynx and British pound / US dollar exchange rate data. Zhang stated that neither ARIMA nor ANN was suitable for all real-time series with the hybrid model developed in this study and that there were linear and nonlinear correlation structures between observations in these series and therefore a hybrid model should be used to estimate both linear and nonlinear components of a time-series (Zhang G. , 2003).

Armano et al. (2005) proposed a hybrid model approach based on ANN combined with a genetic algorithm in stock market prediction (Armano, Marchesi, & Murru, 2005). Yu et al. (2005) presented a new nonlinear hybrid prediction model by combining ANN and generalized linear auto regression (GLAR) to obtain more accurate prediction results and improve prediction performance (Yu, Wang, & Lai, 2005). Kim and Shin (2007) investigated the effectiveness of a genetic algorithm-based hybrid model based on ANN, such as adaptive time-delayed neural networks (ATNN) and time-delayed neural networks (TDNN), to determine transient patterns in stock market prediction (Kim & Shin, 2007).

Zhou and Hu (2008) proposed the hybrid model estimation approach based on Gray and Box-Jenkins ARMA methods (Zhou & Hu, 2008). Khashei et al. (2008), in their work using

ANN and fuzzy regression methods, proposed a hybrid model that provides more accurate results with missing data sets. In the proposed model, the advantages of ANN and fuzzy regression were combined to overcome the limitations in both ANN and fuzzy regression. To show the suitability and effectiveness of the method, it was used in the estimation of the price of gold (Gram/US $) and exchange rates (US/Iranian Rial). The results showed that the proposed model could be an effective way to improve estimation accuracy (Khashei, Hejazi, & Bijari, 2008). Aladağ et al. proposed a new hybrid approach with the Elman's recurrent neural networks (RNN) and seasonal ARIMA (SARIMA) models. In this proposed hybrid model, Canadian lynx data for the period 1821-1934 were used, which consisted of the annual number of lynx traps in the Mackenzie River area in Northwest Canada. Although the data used were minimal, the hybrid method gave the best estimation accuracy in the application results (Aladağ, Eğrioğlu, & Kadılar, 2009). Koutroumanidis et al. (2009), in their studies to examine the role of forests in firewood production in Greece, predicted the future situation of the sale prices of wood produced by the Greek state forest farms. They used ARIMA, ANN and Hybrid models for forecasting and obtained the best estimate results using the ARIMA-ANN hybrid model (Koutroumanidis, Ioannoub, & Arabatzis, 2009).

Koutroumanidis et al. (2011) aimed to establish confidence intervals for predicted values of a time-series in their studies for predicting stock market prices with a hybrid method. The daily closing prices of the shares of Alpha Bank from 28/01/2004 to 30/11/2005 were used as the sample of the study. For the estimation, ANN was applied to the raw data and then the market prices were estimated using the Bootstrap method. Estimation accuracy was measured by using different criteria, and satisfactory results were obtained (Koutroumanidis, Ioannou, & Zafeiriou, 2011). He and Deng (2012) developed a hybrid model using ARIMA and ANN to estimate air pollutant factors in their study. Firstly, ARIMA and ANN were used to estimate the time-series and then a re-estimation was done with the hybrid model that was developed. When the results were compared, it was evident that the hybrid model performed better (He & Deng, 2012).

Babu and Reddy (2014) investigated the nature of volatility by using experimental and simulated data sets such as sunspot, electricity price and stock market data. They first used moving average filter, and later ARIMA and ANN models were applied. A hybrid model was proposed along with ARIMA and ANN models used in the application and some existing HYBRID ARIMA-ANN models. The results from the data sets showed that the hybrid model had a higher estimation accuracy for both single-step and multi-step predictions (Babu & Reddy, 2014). Hocaoğlu et al. (2015) used the hybrid model they created using ANN and regression methods for load estimation in the energy sector. When the error results were compared, it was concluded that the hybrid system had the lowest errors (Hocaoğlu, Kaysal, & Kaysal, 2015).

In Ateşongun's (2015) study, using ARIMA, ANN and the hybrid model created by these two models, he made predictions on the number of wild cats in Canada, sunspots, airline passenger numbers, Australia's New South Wales region's hourly electricity prices and wheat

efficiency in Turkey. The results reached were compared both with the methods used and with the previous studies (Ateşonğun, 2015).

Pablo et al. (2016) proposed a hybrid approach to the reconstruction of the time-series with the creation of ANN and Monte Carlo Simulation. With these models, they tried to estimate the daily milk sales of a dairy company. The results showed that the proposed method could reconstruct the past and predict the future from the known time-series segment (Pablo, ve diğerleri, 2016). Sugiartawan et al. (2017) used a hybrid model that they created with wavelet transform and LSTM to predict the number of tourists coming to Indonesia over a monthly period. The prediction results of the proposed hybrid model were compared with other RNN algorithms, namely ELMAN RNN and Jordan RNN and the hybrid of Elman's wavelet and the hybrid of Jordan's wavelet. They stated that the hybrid model created by the wavelet transform and ANN could be used to predict the trend evolution with the original ANN, which gives Elman and Jordan better training time than RNNs and could predict the number of incoming tourists more accurately than other hybrid methods (Lin, Guo, & Aberer, 2017).

Yu et al. (2018) reached the conclusion of Convolutional Neural Networks based on deep learning to estimate second-hand housing prices in Beijing (Sugiartawan, Pulungan, & Sari, 2017). Lin et al. (2017), inspired by the recent successes of artificial neural networks, proposed TreNet, a completely new hybrid neural network, to predict the trend of time-series. They used three different data sets in their study including electricity consumption, chemical sensor records subject to dynamic gas mixtures at variable concentrations, and daily stock transaction information on Yahoo Finance and the New York Stock Exchange. As a result of the study, they used TreNet's time-series (Convolution Neural Network-CNN) and LSTM models and the Autoregressive Moving Average (ARMA) model from the time-series. The results obtained from CNN, LSTM and ARMA models were compared. They applied a logical regression model to compare the three models used. They concluded that the prediction accuracy of the LSTM, which takes the time-series into account, was better than other methods (Yu, Jiao, Xin, Wang, & Wang, 2018).

Temür et al. used monthly house sales data from past periods as a time-series in their studies for the prediction of house sales in Turkey. In their study with ARIMA, LSTM and the Hybrid model obtained from these two models, they obtained the best estimate result from the Hybrid model (Soy Temür, Akgün, & Temür, 2019).

Methodology

In this part of the study, information about ARIMA, LSTM, which are used in the prediction of sales quantities, and the basic principles and modeling processes of the hybrid model obtained by rational combining of these models are given.

ARIMA

ARIMA is a statistical analysis, it uses time series data. The ARIMA predicts future values by examining the differences between values in the time series. This method is a univariate model developed by George Box and Gwilym Jenkins in 1970 and is also known as a method that gives very successful results in short-term forecasts. One of the critical assumptions of the method is that the applied series is a discrete and stationary series consisting of observation values obtained with equal time intervals. Stationariness means that the series is free from periodic fluctuations (Bircan & Karagöz, 2003). Stability; It requires basic statistical properties such as mean, variance, covariance, or autocorrelation to be constant over time periods (Babu & Reddy, 2014).

An ARIMA model consists of 3 components Auto regression (AR), Integrated (I), and Moving average (MA). Each component is a parameter. To represent these parameters, ARIMA models use a standard notation p, d, and q. This standard notation indicates the type of ARIMA model used (Fattah, et al., 2018).

In the determination process of the model, first of all, by applying the stationarity and seasonality analysis of the series, it is determined whether the series is stationary or not. If the series are not static, this process is continued by applying the dth degree differencing process until a static series is reached. D, which shows the degree of differencing; gets the value of 0 in static series, 1 in series that become static with first-degree differencing, and 2 in series that are made static with second-degree differencing. (d) is a positive integer, and the value of d is usually taken as 1 or 2 in practice. However, if the series are static, there is no need to apply any differencing to the series (Smith, 2018). If the differencing operation is performed (d) times, the integration parameter of the ARIMA model is set to (d). Then, identification is performed on the stationary data obtained. In this process, the parameters of the autoregressive (AR) and moving average (MA) operations shown in equation (1) are determined as (p) and (q), respectively (Newbold, 1983).

p: degree of autoregressive model (AR)

d: differencing degree

q: degree of moving average model (MA)

$$y_t = \alpha_1 w_{t-1} + \alpha_2 w_{t-2} + \cdots + \alpha_p w_{t-p} + \varepsilon_t - \theta_1 \varepsilon_{t-1} - \theta_2 \varepsilon_{t-2} - \cdots - \theta_q \varepsilon_{t-q} \qquad (1)$$

For the t time here, y_t denotes the linearized real data, w_t weight values, while ε_t denotes the moving average error. As shown in the formula, a linear relationship was established between actual data yt to be predicted, the observed (p) data $(y_{t-1}, y_{t-2}, \ldots, y_{t-p})$, and ($q$) error data ($\varepsilon_t$, ε_{t-1}, …, ε_{t-q}). Differencing removes the changes in the level of a time series, eliminating trend and seasonality and consequently stabilizing the mean of the time series.

In order to difference the data, the difference between consecutive observations is computed. The linearized real data y_t is replace with its lagged value Δy_t and mathematically, this is shown as:

$$\Delta y_t = y_t - y_{t-d} \qquad (2)$$

Δ: It refers to the difference operator series.

While the autocorrelation values of alternative models such as ARIMA decrease geometrically or exponentially, autoregressive fractionally integrated moving average models (ARFIMA OR FARIMA) have hyperbolic decreasing autocorrelation values (Bhardwaj, et al., 2020). In the financial time series within this structure, the existence of long memory is talked about. Long memory models are expressed as FI processes, and d, which has a degree of integration, technically takes a fractional value (Karia, et al., 2013) (Durham, et al., 2019) (Bukhari, et al., 2020).

LSTM

LSTMs are a particular type of RNN designed to learn long-term dependencies. They were first developed by Hochreiter and Schmidhuber (1997). It has a complex structure called the LSTM unit in the hidden layer it contains. A simple representation of this structure is given in Figure 1. Since they work very well on a wide variety of problems, they are widely used today.

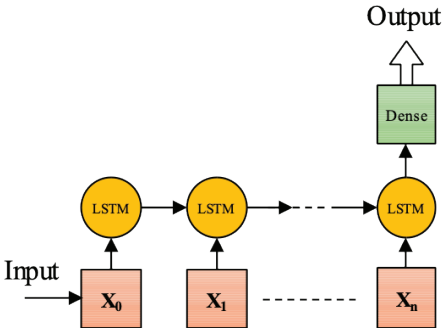

Figure 1. LSTM Architecture (Atienza, Posted on 2017)

To roughly describe, in an LSTM structure, there is also a memory along with the RNN cell. Thanks to this memory, information from the previous time can be retrieved and transmitted to the next one. The model decides which information to take with training. Remembering information for a long time is in practice the default behavior of these networks and not something they try to learn. An LSTM unit is shown in Figure 2.

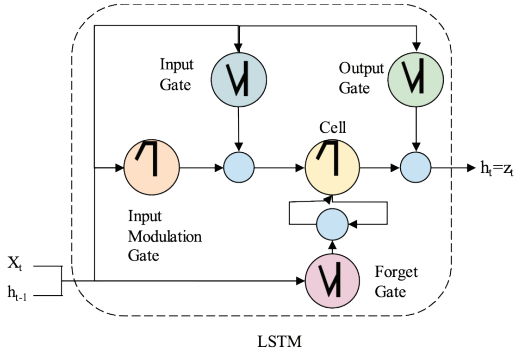

Figure 2. Long Short-Term Memory Structure (Kang, 2018)

Here X_t represents the input data at the *t* time step and the output of the previous unit. *ht* is hidden units output while h_{t-1} is their previous output. For LSTM unit, input gate i_t^j(3), the forget door f_t^j(4) and output gate σ_t^j(5) can be calculated using equations.

$$i_t^j = \sigma(w_{xi}x_t + w_{hi}h_{t-1} + b_i)^j \quad (3)$$

$$f_t^{\,j} = \sigma\left(w_{xf}x_t + w_{hf}h_{t-1} + b_f\right)^j \quad (4)$$

$$\sigma_t^j = \sigma(wx_t + w_{h\sigma}h_{t-1} + b_\sigma)^j \quad (5)$$

Here, σ is sigmoid function, *w* terms are weight matrices and *b* terms are voltage vectors. Unlike the traditional epoch unit, each *j*. LSTM unit preserves its memory at *t* time with (c_t^j). Here, the equation whose memory cell is given is updated via equation (6).

$$c_t^j = f_t^j c_{t-1}^j + i_t^j \tilde{c_t}^j \quad (6)$$

The new memory content is updated with equation (7) and the output for the LSTM unit is calculated by equation (8).

$$f_t^j = tanh(wx_t + w_{hc}h_{t-1} + b_c)^j \quad (7)$$

$$h_t^j = \sigma_t^j tanh\,(c_t^j) \quad (8)$$

As in other ANNs, training is carried out on LSTM networks by epoch. An epoch specifies the total number of iterations of a given set of data used for training purposes in the calculation of network weight values (*w*). An epoch refers to the fact that an entire data set has passed forward and then back on the network.

Updating weights to optimize models of deep learning algorithm, and thus transmitting the entire data set over a single network many times to obtain a better and more accurate prediction model makes sense. However, it is not clear how many epoch numbers will be needed to achieve optimal weights and to train a model with the same data set. Replication (epoch) specifies the total number of recurrences that a particular dataset is used for educational purposes to calculate the network's weight values (w). An epoch signifies that an entire dataset had passed through the network once before and then returned over the network. Different sets of data exhibit different behaviors, so a different number of epochs may be needed to best train networks. Based on this observation, many prediction studies were carried out with different epoch values in the study, and all trial results are presented in the application section.

HYBRID

While the ARIMA models are good at modeling the linear relationship in the time-series, they are insufficient at modeling nonlinear relationships. The LSTM models can model both linear and nonlinear relationships but cannot provide the same results for each data set. Therefore, to reach the best prediction results, hybrid models based on the principle of separate modeling of linear and nonlinear components of time-series are employed. These models, with great success in prediction work for time-series analysis, use multiple learning algorithms to achieve better predictive performance than founder learning algorithms (Opitz & Maclin, 1999). The purpose of these models is to increase the diversity of models and to achieve better results (Adeva, Beresi, & Calvo, 2005) (Oliveira & Torgo, 2014).

When the results obtained with hybrid models and the results obtained by using the models individually were compared, it was observed that they could reduce the general variance or error, even if they are unrelated (Khashei M., 2008). Due to this reason, hybrid models are recognized as the most successful models for forecasting tasks.

This study is based on the hybrid model that Zhang (2003) suggested for a hybrid ARIMA-YSA model for the prediction of time series. This model is based on the assumption that any time series is a mathematical sum of two linear and non-linear model components (Zhang, 2003). Accordingly, the ARIMA-LSTM hybrid model that was created to make predictions by using the historical data of a time series and given a blog diagram in Figure 3, is as follows.

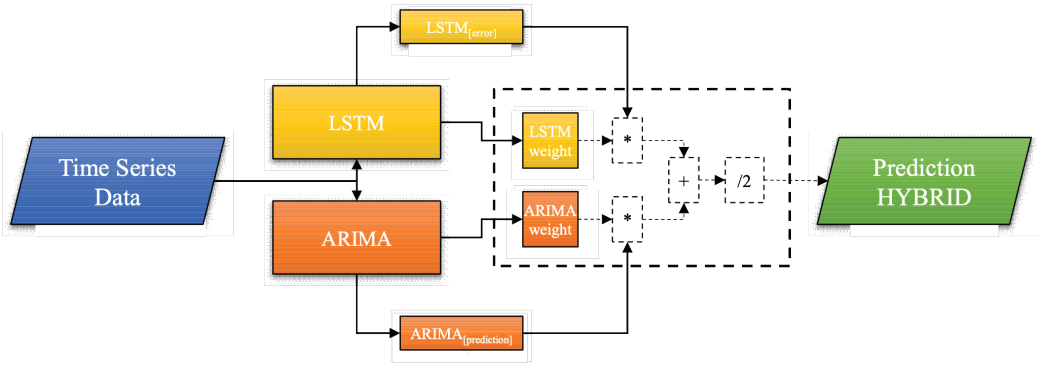

Figure 3. Hybrid Model Diagram

The time-series prediction formula of the generated model can generally be expressed as the sum of linear and nonlinear components, as shown in equation (9).

$$y_t = L_t + N_t \qquad (9)$$

L_t shows the linear component of the time-series, whereas N_t shows the non-linear component. In the hybrid model, the linear component of the time-series L_t is first estimated using the ARIMA model, N_t then estimated by the LSTM model. Then, error values of both models are calculated. The formula for this calculation is given in Equations (10) and (11).

$$lstm_{error} = lstm\_average[error] \qquad (10)$$

$$arima_{error} = arima\_average[error] \qquad (11)$$

The weights of the models are calculated by using the obtained error values in Equations (12) and (13). Normalization process was carried out in calculating the weight values.

$$lstm_{weight} = \left(1 - \left(\frac{lstm_{error}}{lstm_{error} + arima_{error}}\right)\right) * 2 \qquad (12)$$

$$arima_{weight} = 2 - lstm_{weight} \qquad (13)$$

The weight values of the models and finally each prediction value of our hybrid model are obtained with the given equation (14).

$$hibrit_{predict}[i] = (lstm_{weight}[i] * lstm_{error}[i] + arima_{weight} * arima_{predict}[i])/2 \qquad (14)$$

Success Criteria of Models

No matter which of the prediction methods is used, they do not produce 100% accurate value. In fact, if the future was known 100%, then it would not be a prediction. Therefore, each prediction has a certain error rate. It is one of the most widely accepted criteria in the process of choosing one of the various prediction models for the model to be compatible with the data and high prediction success. The essential criteria used to compare the predictive success of the models is the accuracy of the prediction. This is measured by analyzing the estimated errors (Sarı, 2016).

To measure the model prediction success of the three methods discussed in the study *MSE*, *RMSE, MAPE* and *MAE* criteria were used. The formulas used to calculate these criteria are given in Table 1 (Sallehuddin, Shamsuddin, Hashim, & Abraham, 2007)

Table 1
Success Criterion (Correlogram) Formulas

Name	Formulas
MSE	$MSE = \frac{1}{n}\sum_{t=1}^{n}(y_t - \hat{y}_t)^2$
RMSE	$\sqrt{\frac{1}{n}\sum_{t=1}^{n}\left(y_t - \hat{y}_t\right)^2}$
MAPE	$\left(\sum_{t=1}^{n}\left\|\frac{y_t - \hat{y}_t}{n}\right\|\right)$
MAE	$\left(\sum_{t=1}^{n}\left\|\frac{y_t - \hat{y}_t}{y_t}\right\|\right)\frac{100}{n}$

Here y_t represents the real value, $\hat{y}_t$ predicted value, *n* represents the number of predicted periods. The model with the smallest criteria values obtained with the above formulas should be chosen as the most suitable model.

The Data Set and Methods of the Study

The data used in this study are product sales data of a business operating in the construction industry and are derived from the author's previously published doctoral thesis. Company and product information are reserved for competition elements and at the request of the company authorities. Moreover, the product quantity data have been changed proportionally for privacy. The data were provided by interviews with the sales manager and accounting manager. In 2018, the company suspended production due to the robotization of the production system. For this reason, access to data up to 2017 has been provided. The reason for conside-

ring the year 2010 as the starting year is derived from the fact that previous data were stored in the form of 3-month periods instead of monthly.

Within the scope of the study, the sales volumes of a product used in the construction industry for 2010 (1) –2017 (12) months were provided, and a total of the 96-month data set was used. Since the data is numerically significant, it was processed with models by reducing at the rate of x (1000). The related data set was represented in a series to be used in the neural network model. The graph of the data represented by years is given in Figure 4.

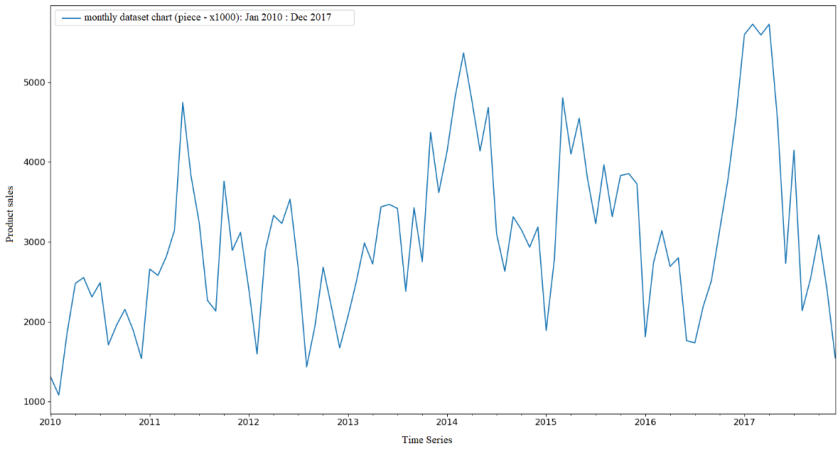

Figure 4. Monthly Product Sales Data Set Chart

A data set in forecasting applications is divided into training and test data. The amount of data that should be for each set is the main problem encountered in forecasting applications, and artificial neural networks should be trained to use as much data as possible. The data not used in the training set are used in the test set. The output obtained by feeding the test data to the network is compared with the actual output values. The main objective is to check whether the power to represent the sample is sufficient.

In the literature, it is generally accepted that the data set is divided into 70% or 80% training, 30% or 20% test in determining the training and test data (Prieto, et al., 2019) (Vasques, et al., 2016) (Brownlee, 2020) (Zou & Qu, 2020). In this study, to obtain the most relevant results from the data set, training rates in different combinations were tried. These combinations were 67% training, 33% testing and 73% training, 27% testing. The reason for determining these rates differently from the generally accepted rates was due to the determination of the most appropriate and inappropriate rates by trying many training rates (Brownlee, 2020).

The data were applied to the ARIMA, one of the linear methods commonly used in time-series predictions, and the LSTM network, one of the nonlinear methods recently used for deep learning algorithms. Besides, hybrid methods generally accepted in the literature were examined, and a hybrid method based on ARIMA and LSTM was tested for this study. All methods were coded in Python 3.6 6 (Rossum, 2001) programming language in computer environment, and ready-made libraries were used as open-source code.

Analysis and Findings

In this part of our study, the information about the data used in our applications and the findings obtained from the results of the application are given.

ARIMA

The ARIMA (p, d, q) models were determined by using p [0, 1, 2, 3], d [0, 1, 2], q [0, 1, 2] values for the sales data estimation performed with the ARIMA estimation method, and Correlogram examinations of each of these models were performed separately. The results of the success criteria and model error comparisons of the estimation studies are given in Table 2, and the significance tests were performed both on this table and the output graphics formed by the models. According to the model results in the tables, the model with a lower percentage error rate is accepted as the model with a higher performance in estimation. Accordingly, as a result of the tests, ARIMA (1,0,0) and ARIMA (1,0,1) models with the lowest MAPE values of the study, the training data set of which was 67%, and ARIMA (1,0,0) and ARIMA (1,0,1) models with the lowest MAPE values of the study, the training data set of which was 73%, made the most successful predictions. Among these predictions, 67% of the study-test data set produced lower MAPE values showing that it performed more valuable estimates.

Table 2
ARIMA Models Correlogram Results (67% Training Set)

Comparison of ARIMA Models				
ARIMA	**MAE**	**MSE**	**RMSE**	**MAPE**
(0,0,1)	775.124	934643.842	966.770	0.255
(0,0,2)	751.472	850727.707	922.349	0.252
(0,1,0)	692.830	766967.805	875.767	0.253
(1,0,0)	672.267	681849.325	825.742	0.234
(1,0,1)	675.996	690921.199	831.217	0.235
(1,0,2)	684.416	707584.581	841.180	0.238
(1,1,0)	688.410	757390.500	870.282	0.251
(2,1,0)	676.638	784725.580	885.847	0.247
(2,2,0)	775.778	935149.511	967.031	0.278

Table 3
ARIMA Models Correlogram Results (%73 Training Set)

Comparison of ARIMA Models				
ARIMA	**MAE**	**MSE**	**RMSE**	**MAPE**
(0,0,1)	837.842	1048519.893	1023.973	0.281
(0,0,2)	802.764	944684.711	971.949	0.276
(0,1,0)	699.415	828872.420	910.424	0.266
(1,0,0)	710.461	760316.150	871.961	0.254
(1,0,1)	716.008	773831.273	879.677	0.256
(1,0,2)	723.226	792962.528	890.484	0.259
(1,1,0)	706.616	830713.220	911.435	0.268
(2,1,0)	688.728	858269.317	926.428	0.262
(2,2,0)	781.374	967890.861	983.814	0.293

Graphs for comparing the 31-month forecast and 26-month forecast data obtained with the best estimates with the lowest MAPE values and the 26-month forecast data with the actual test data are given in Figure 5 and Figure 6.

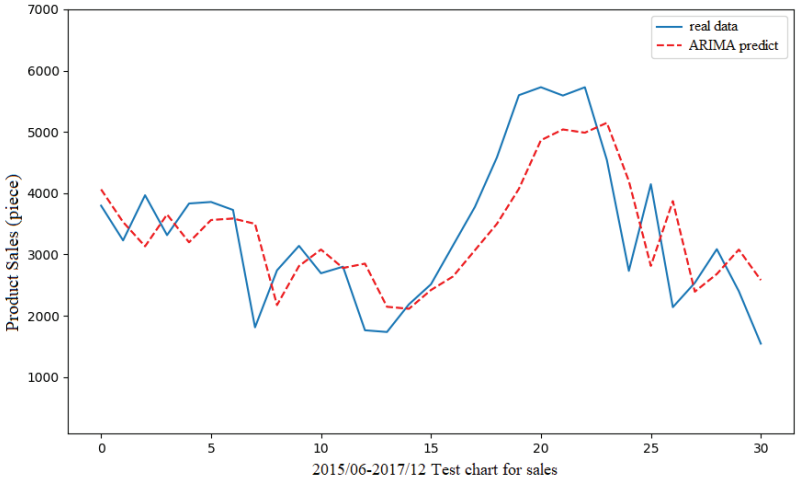

Figure 5. ARIMA (1,0,0) Model and Real Data Set Comparison Chart

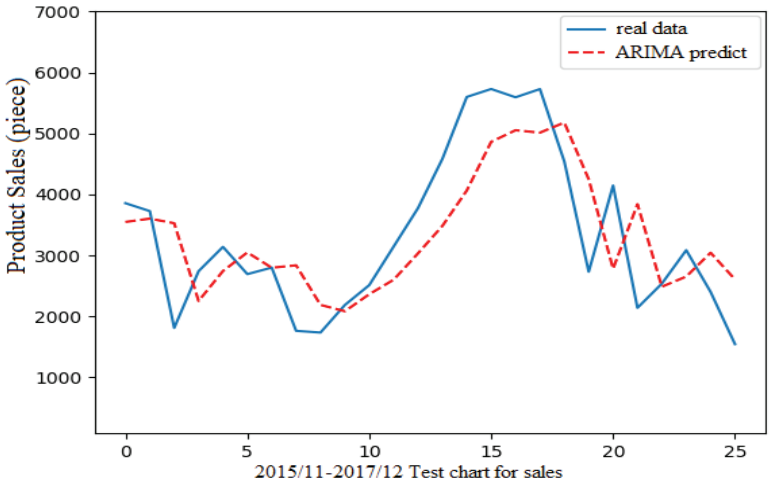

Figure 6. ARIMA (1,0,1) Model and Real Data Set Comparison Chart

When Figure 5 and Figure 6 are analyzed, it is seen that the monthly sales values obtained from the real data and the estimation studies are in overlapping structure and the deviations between them are not excessive. The success seen in the graphics can be observed more clearly than the similarity of the direction breaks as well as the proximity values of the data. The models used here can produce values very close to real data, with an error value of 0.234 and 0.235 MAPE, respectively. This situation indicates the success of the model used in the study.

LSTM Analysis Results

In this part of the study, time-series based Long Short-Term Memory (LSTM) architecture was used. This part coded in Python software was realized with KERAS, a deep learning library used in LSTM model development (Chollet, 2015).

The LSTM network used was run on the monthly sales of the products listed between 2010 and 2017. In this model, as in the ARIMA model, estimates were made by using training combinations of 67% and 73%. The data not used in training were used for testing. Different epoch numbers were tried during the training process and the resulting error values were examined. Error values resulting from epoch numbers according to the training combinations performed are given in Table 4 and Table 5, respectively.

Table 4
LSTM Models Correlogram Results (%67 Training Set)

Comparison of LSTM Models				
Epoch	**MAE**	**MSE**	**RMSE**	**MAPE**
1000	876.925	1086744.667	1042.470	0.309
1500	1055.303	1543692.874	1242.454	0.364
2000	1223.365	2021929.469	1421.946	0.406
2500	1332.994	2450055.299	1565.265	0.445

Table 5
LSTM Models Correlogram Results (%73 Training Set)

Comparison of LSTM Models				
Epoch	**MAE**	**MSE**	**RMSE**	**MAPE**
1000	687.389	661910.062	813.579	0.245
1500	795.090	954889.250	977.184	0.275
2000	900.901	1261486.750	1123.159	0.297
2500	1027.180	1895367.375	1376.723	0.318

In applications performed with both 67% training sets and 73% training sets, as shown in Tables 4 and 5, the results produced by models trained with 1000 epoch have the lowest error rate. The graphical representations of the prediction results generated by the network models trained with both training sets are as in Figure 7 and Figure 8.

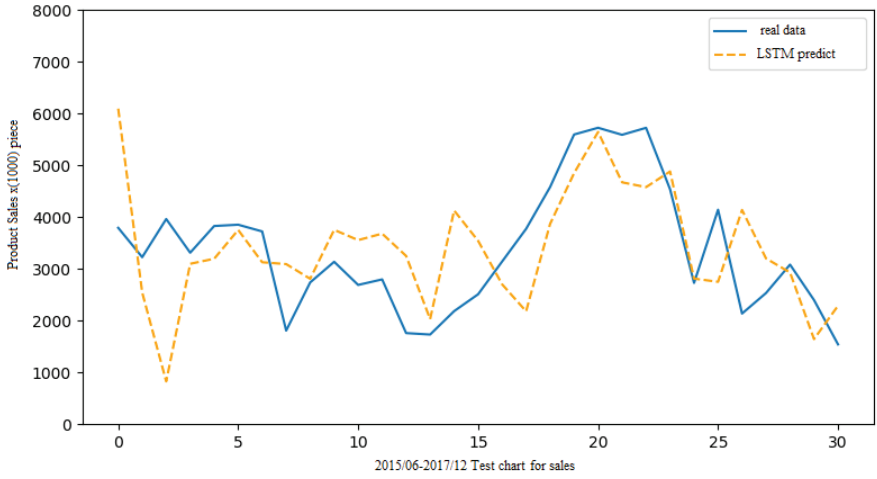

Figure 7. LSTM (1000 epoch) and Real Data Set Comparison Chart (%67 Training Set)

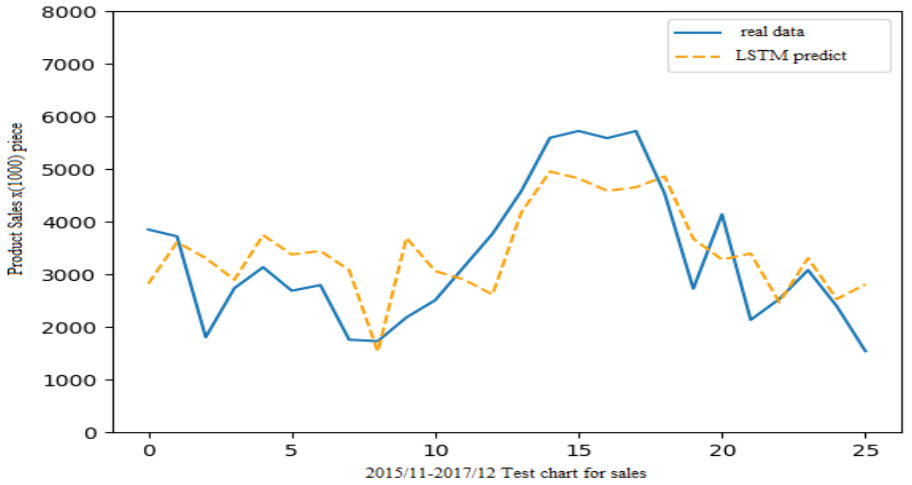

Figure 8. LSTM (1000 epoch) and Real Data Set Comparison Chart (%73 Training Set)

It is possible to obtain more successful results with the use of more data in the LSTM model (Liu, Tan, & Wang, 2019). Nevertheless, as seen in the figures, LSTM models have managed to produce successful results with little data usage. It produced a lower error value compared to the ARIMA model, with a 73% training data set mapping with a 0.245 MAPE value, which is the success criterion assessment. On the other hand, the ARIMA model produced a lower error value in comparison of 67% training data set. As a result of this comparison, it can be said that the ARIMA model for 67% training sets and the LSTM model for 73% training sets were more successful than the other model. The state of having achieved more successful results with the 73% training kit compared to the 67% training kit is proof that higher performance values can be reached due to the increase of the number of data for the LSTM model. However, there are also studies in the literature that prove that success falls after a certain set of data (Liu, Tan, & Wang, 2019) (Liu, Tan, & Wang, 2019).

Hybrid Analysis Results

In this part of the study, estimation experiments were carried out using the hybrid model designed in Figure 3 and different percentile education sets as in other models. All parameters in ARIMA and LSTM models are used for the Hybrid model. A summary of the best estimation results obtained with the hybrid model is given in Table 6.

Table 6
Hybrid Model Correlogram Results (%67 Training Set)

Comparison of Hybrid Method Results					
LSTM epoch	**ARIMA (p, d, q)**	**MAE**	**MSE**	**RMSE**	**MAPE**
1000	(0, 1, 0)	474.901	539710.087	734.650	0.173
	(0, 1, 1)	473.856	505515.043	710.996	0.176
	(1, 1, 1)	547.064	550803.800	742.162	0.203
	(1, 2, 0)	454.536	574853.193	758.191	0.166
	(2, 1, 0)	471.357	523651.351	723.638	0.175
	(2, 2, 0)	455.894	562571.828	750.048	0.167
1500	(0, 1, 0)	441.230	517109.254	719.103	0.158
	(0, 1, 1)	439.884	483443.968	695.301	0.162
	(1, 1, 1)	519.856	520319.460	721.332	0.192
	(1, 2, 0)	425.395	576725.599	759.425	0.151
	(2, 1, 0)	439.576	500267.806	707.296	0.161
	(2, 2, 0)	440.020	582412.655	763.160	0.156
2000	(0, 1, 0)	435.374	484493.392	696.056	0.151
	(0, 1, 1)	438.542	462836.972	680.321	0.157
	(1, 1, 1)	525.968	501871.120	708.429	0.190
	(1, 2, 0)	406.268	556548.101	746.022	0.143
	(2, 1, 0)	436.966	472535.368	687.412	0.156
	(2, 2, 0)	427.079	572413.420	756.580	0.150
2500	(0, 1, 0)	437.287	497100.030	705.053	0.155
	(0, 1, 1)	439.369	474126.965	688.569	0.161
	(1, 1, 1)	538.044	529362.677	727.573	0.198
	(1, 2, 0)	418.051	596092.088	772.070	0.148
	(2, 1, 0)	436.265	481295.563	693.755	0.159
	(2, 2, 0)	441.840	614257.378	783.746	0.157

When the values obtained with the 67% training set in the table are examined, it is seen that much more successful results were achieved compared to the results obtained from both the LSTM network and ARIMA models. The most successful estimation in this training set is the 0.1143MAPE value study produced by the LSTM (2000 epoch) and the ARIMA (1,2,0) model. It can be stated that this error value is much lower than the error values produced by other singular models, and a very successful result was obtained. This situation is an indication that, as mentioned in the examples in the literature, hybrid models give better results than single models and can be used to achieve successful results. The estimation results of the LSTM (2000 epoch) -ARIMA (1,2,0) model were determined as the best estimate and the output graph of the real values are given in Figure 9.

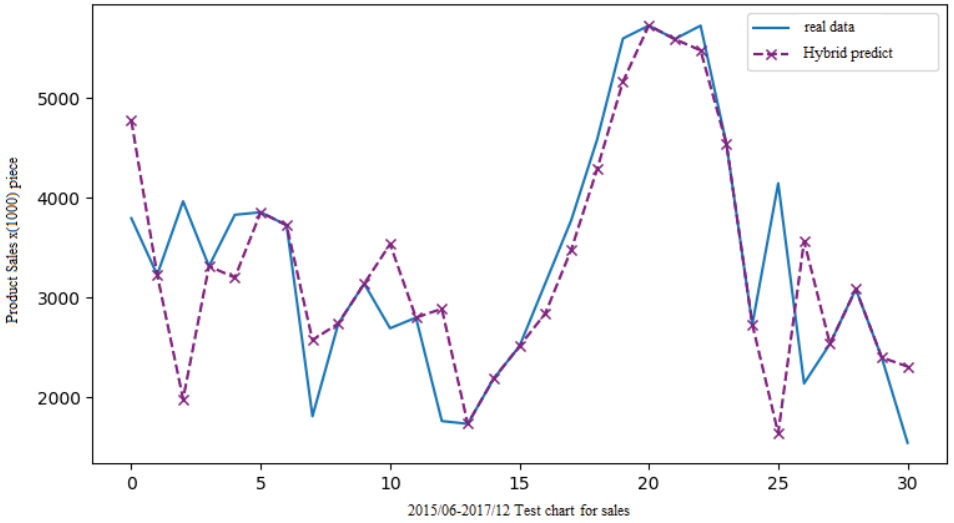

Figure 9. Hybrid Model and Ground Truth Comparison Chart (%67 Training Set)

As can be seen from the figure, the estimate of the model coincides with the real data graph. It is an indication that the prediction is very successful. Especially when looking at trend breakouts, it can be observed that the forecast graph behaves precisely like the real graph, except for minor differences. On the other hand, to improve the model used, the training set was increased to 73% and different attempts were made with LSTM and ARIMA models. A summary of the results obtained in the estimations made is given in Table 7.

Table 7
Hybrid Model Correlogram Results (%73 Training Set)

Comparison of Hybrid Method Results					
LSTM epoch	**ARIMA (p, d, q)**	**MAE**	**MSE**	**RMSE**	**MAPE**
	(0, 1, 0)	459.247	491694.830	701.210	0.185
1000	(1, 2, 0)	431.770	444982.797	667.070	0.180
	(2, 1, 0)	473.266	515363.694	717.888	0.188
	(0, 1, 0)	461.439	481297.330	693.756	0.181
1500	(1, 2, 0)	421.336	447043.373	668.613	0.171
	(2, 1, 0)	471.049	503728.652	709.738	0.182
	(0, 1, 0)	442.282	459427.418	677.811	0.172
2000	(1, 2, 0)	409.096	463999.091	681.175	0.165
	(2, 1, 0)	446.925	471641.035	686.761	0.170
	(0, 1, 0)	413.791	484388.432	695.980	0.157
2500	(1, 2, 0)	360.368	474134.222	688.574	0.141
	(2, 1, 0)	432.843	509609.739	713.870	0.161
	(0, 1, 0)	408.578	533826.667	730.634	0.155
3000	(1, 2, 0)	344.138	480333.312	693.061	0.135
	(2, 1, 0)	445.409	578365.642	760.504	0.166

	(0, 1, 0)	407.097	537043.602	732.833	0.154
3500	(1, 2, 0)	338.184	470006.272	685.570	0.133
	(2, 1, 0)	446.167	585519.850	765.193	0.166
	(0, 1, 0)	416.356	531732.634	729.200	0.156
4000	(1, 2, 0)	342.317	452430.129	672.629	0.134
	(2, 1, 0)	447.486	581406.834	762.500	0.163
	(0, 1, 0)	408.811	538732.181	733.984	0.157
4500	(1, 2, 0)	339.349	463405.842	680.739	0.136
	(2, 1, 0)	448.035	588540.125	767.164	0.169

According to the values obtained in the table, it is seen that the error value generated by the hybrid model created by the LSTM 3500 epoch and ARIMA (1,2,0) models is 0.133 MAPE. This shows that a very successful result was achieved compared to the model created with the 67% training set. The graphic representation of this model is as shown in Figure 10.

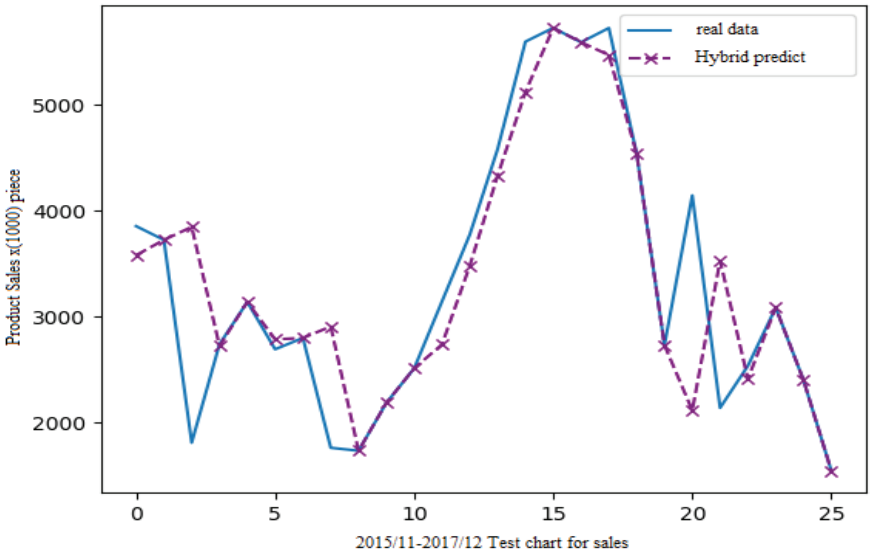

Figure 10. Hybrid Model and Ground Truth Comparison Chart (73% Training Set)

Conclusion

Nowadays, businesses, institutions and nations which want to continue and develop their lives according to competitive conditions and rapidly changing technological developments have to make a future-oriented plan. As stated before, sales quantity budgets formed by sales forecasts should be prepared correctly and reliably, as they are the basis for the preparation of other budgets.

Monthly sales data relating to the years 2010-2017 were used for demand estimation purposes. In sales quantity estimates, ARIMA, LSTM, and a hybrid method made out of these

two models were made use of. As a result of the models, the sales quantity budget was created for 2017, and the comparison was made. To estimate the models and compare these estimates, 67% of the data set were reserved for training of the models, the remaining 33% were used as test data. On the other hand, as a second case, experiments were carried out with a training set of 73% and test data of 27%. After the data were arranged, the test data were estimated by training with ARIMA, LSTM and Hybrid model. Based on the estimation results, all of the models were compared.

Table 8
Comparison of ARIMA, LSTM and Hybrid Models

Comparison of All Models					
Training Set (%)	**MODEL**	**MAE**	**MSE**	**RMSE**	**MAPE**
67	ARIMA(1,0,0)	672.267	681849.325	825.742	0.234
	LSTM (1000 epoch)	876.925	1086744.667	1042.470	0.309
	HYBRID (LSTM 2000 epoch-ARIMA(1,2,0))	406.268	556548.101	746.022	0.143
73	ARIMA(1,0,0)	710.461	760316.150	871.961	0.254
	LSTM (1000 epoch)	687.389	661910.062	813.579	0.245
	HYBRID (LSTM 3500 epoch-ARIMA(1,2,0))	338.184	470006.272	685.570	0.133

As seen in Table 8, the RMSE values for the 67% training set of ARIMA, LSTM and hybrid models were calculated as 825.742, 1042.470 and 746.022 respectively, while it was calculated as 871.961, 813.579, 685.570 in the 73% training set. Considering the RMSE values, it is seen that the hybrid model gave better results in both training sets. In terms of MAPE values, the value of 0.133 for hybrid model, 0.254 for ARIMA and 0.245 for LSTM model was calculated in the 73% training set. This proves that, in terms of MAPE values, the hybrid model provided better results for both training sets compared to the other two models.

According to the RMSE values, the most successful model was the hybrid method, and in comparison, to the ARIMA estimation results, it gave better performances of about 16.9% and 15.7% compared to the LSTM estimation results. With the hybrid model which gave more successful results in terms of MAPE success criterion, approximately 43.2% better results were obtained from the ARIMA and 45.7% better than the LSTM. Both this study and other studies conducted in the literature clearly show that making predictions by combining multiple methods that can model different functional relationships in the data set rather than estimating time-series with a single method gives more effective results. The findings obtained as a result of the study also confirm this. Moreover, when the obtained results were compared with the real sales data of the company, it was concluded that the values closest to the actual data were obtained from the hybrid method.

When the MSE values were taken into consideration, the hybrid model achieved a performance increase of approximately 37.4% according to the estimations made with the ARIMA

model and 62.9% according to the estimates made with the LSTM model. Likewise, in terms of MAE success criterion, the Hybrid model was approximately 40.5% better than ARIMA model and 52% better than LSTM model. Both this study and other studies conducted in the literature clearly show that making predictions by combining multiple methods that can model different functional relationships in the data set rather than estimating time-series with a single method, gives more effective results. The findings obtained as a result of the study also confirm this.

In the study, the monthly sales quantity data required to create the sales quantity budget of an enterprise was estimated by using the methods mentioned above. The data used in the estimation phase was not limited to making a single estimate by entering the program, but it was repeatedly tried dozens of times until fair values were obtained. The purpose of not limiting to a single model, using different models and hybrid models created with these different models was to determine the configuration that gives the lowest RMSE and MAE values. For this purpose, ARIMA, LSTM and a hybrid model formed from these two models were used as a model because they are widely used in the prediction studies on social sciences today. The hybrid model provided the best performance among these three models. As can be seen above, the error values found for each method are quite low.

Within the scope of the study, the sales quantity budget data of the enterprise for 2017 are given in Table 9. The graphical representation of these data is as given in Figure 11. While creating the table, sales quantity budget data are presented as the values obtained as a result of a particular mathematical operations due to data privacy. Since the same formula was applied to all data, except for the appreciable width in the *y* axis, there will be no trend direction difference between the graphical representation of the actual data and the graphical representation of the modified data.

Table 9
2017 (Monthly) Sales Volume Budget According to the Methods Used *

2017	ARIMA (1,0,0) %67 Training Set	ARIMA (1,0,1) %67 Training Set	ARIMA (1,0,0) %73 Training Set	ARIMA (1,0,1) %73 Training Set	LSTM 1000 epoch %67 Training Set	LSTM 1000 epoch %73 Training Set	Hybrid (LSTM 2000 epoch-ARIMA (1,2,0) %67 Training Set	Hybrid (LSTM 3500 epoch-ARIMA (1,2,0) %73 Training Set
January	1506.6	1504.0	1506.6	1504.0	1433.0	1545.6	1931.6	1895.7
February	1799.7	1799.3	1799.7	1799.3	1795.6	1834.8	2175.4	2119.7
March	1867.8	1869.6	1867.8	1869.6	2089.7	1787.0	2069.4	2069.4
April	1845.2	1854.8	1845.2	1854.8	1729.9	1698.9	2026.6	2024.8
May	1904.8	1916.2	1904.8	1916.2	1695.6	1724.1	1680.2	1680.2
June	1553.2	1572.3	1553.2	1572.3	1807.4	1800.0	1011.2	1011.2
July	1041.4	1029.3	1041.4	1029.3	1041.7	1362.9	811.7	783.3
August	1432.2	1420.9	1432.2	1420.9	1019.2	1215.5	1480.3	1306.5
September	885.8	920.4	885.8	920.4	1532.7	1258.8	818.6	893.7
October	992.2	981.9	992.2	981.9	1185.9	915.4	1142.2	1142.2
November	1139.6	1126.6	1139.6	1126.6	1085.8	1226.1	888.7	888.7
December	955.6	964.8	955.6	964.8	609.8	938.1	800.8	572.0

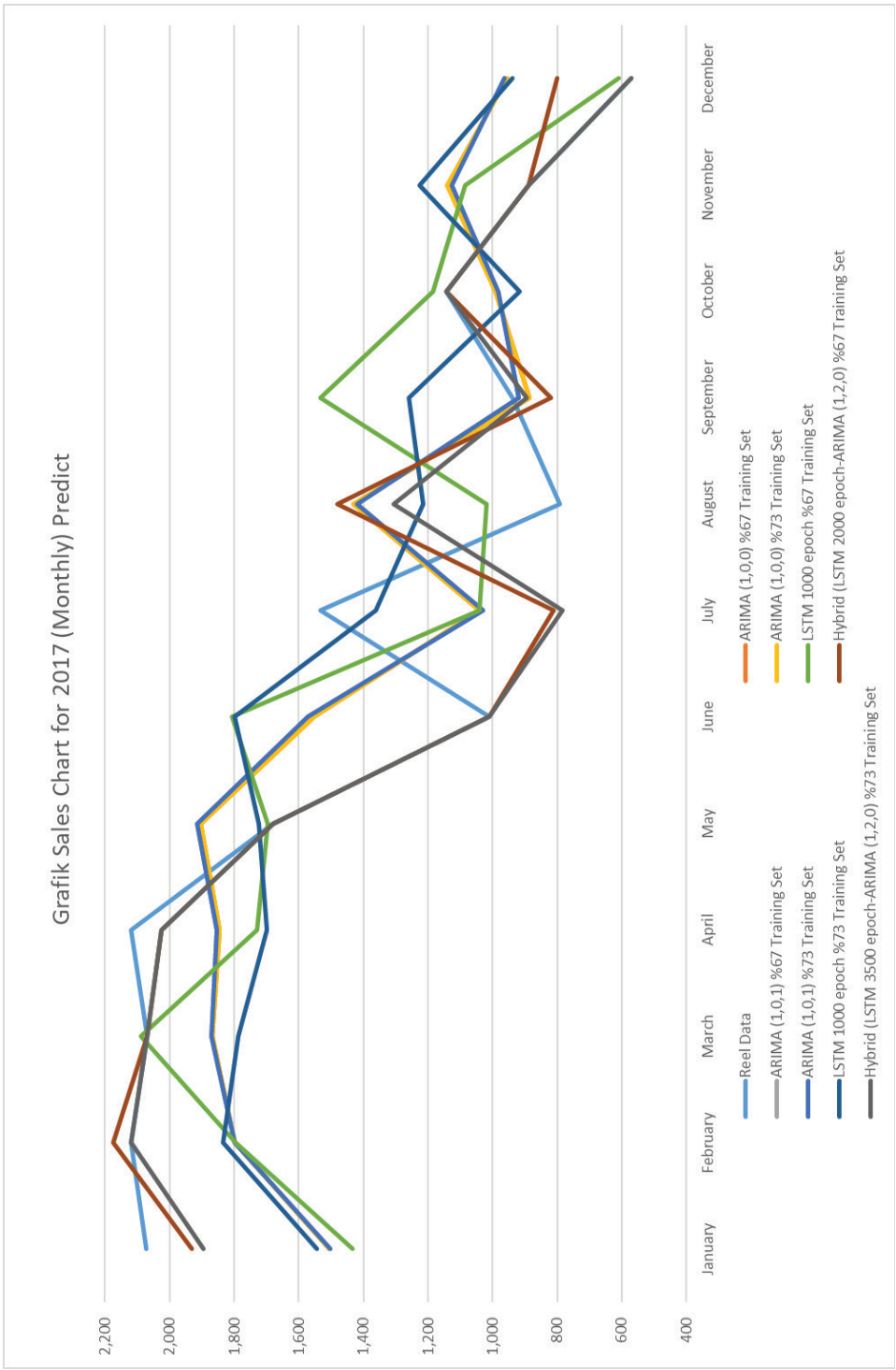

Figure 11. Comparison of Sales Volume Estimates by Methods

The graphic above gives a comparison of the sales estimates obtained from the methods used in the application. Sales data realized in graphical representation are also included in the drawing. As can be seen from the figure, there was not an extreme deviation in all the methods used. The real data graph and the forecast graphs were formed at close levels. In some months, an increase/decrease (such as July-August) occurred in the real data graph, while an opposite result such as a decrease/increase in the forecast graphs was obtained. This can be explained by changes in economic conditions, differences in demand for the industry, etc. As the results obtained are close to each other, all of the methods can be used to create the sales quantity budgets of the business as mentioned earlier. However, it is possible to state that this is the best method since the best result is taken from the hybrid model used in the application and the aim is the most accurate estimate. This situation is an indication that the study has achieved its main purpose.

The results obtained from the methods used in the study are very efficient in terms of performance criteria. In the case of having access to data in later studies, re-trials with further data usage are planned and both creating other budgets in enterprises (production, investment, cash budget, etc.) with the same methods and also the comparison of the results in terms of performance with predictions using different methods are planned.

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Authors' Contributions : Ayşe SOY TEMÜR has carried out the stages of determining the subject of research, examining the relevant models, collecting their data, recommending the method to be used in the research, carrying out the analysis and test studies, and the interpretation of the data by entering them into the analysis program. Şule YILDIZ contributes to the design of the research, the evaluation and guidance of the study at all of its stages, and the interpretation of the article. All authors contribute to the interpretation of results, edit the text, review it, and approve the article.

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RESEARCH ARTICLE

Price Sensitivity Measurement: A Yield Management Approach*

Okan Çolak[1], Levent Koşan[2]

Abstract
The purpose of this paper is to investigate and identify the potential revenue losses, at price points determined by price sensitivity measurement, between actual revenue and potential revenue that can be gained, in terms of yield management. A case study was carried out in a 5 star hotel business in Aydın, Turkey. In the study, a questionnaire was conducted to determine price resistance levels, price threshold limits, price sensitivity levels and price perceptions based on the room quality perceptions of the tourists visiting the hotel business. Also, an interview was performed with the accounting manager and the front office manager about the room prices determined. Hotel businesses can determine the optimal price by depending on the quality and value perception of the customers; thus they can use their limited capacity more efficiently so that they can maximize yield. This study showed that the hotel business lost room revenue at all points calculated. The hotel business suffered a potential loss of 35-40% because of the high occupancy rate in July and August. The hotel industry could have room sales revenues much more than the actual room sales revenues, especially if the agency commission expenses can be reduced.

Keywords
Yield management, Price Sensitivity Measurement, Willingness-to-pay, All Inclusive System, Hotel Management

Introduction

Customers decide to buy according to their thoughts about perceived value and what the current price should be rather than the price stated by the businesses (Kotler and Keller, 2012). Moreover, the price is a criterion indicating the potential customers' "willingness to pay" for a product/service. Also, the price sensitivity of tourists is high, especially in hotel businesses. Therefore, customers' willingness to pay and price sensitivities must be taken into account when making a pricing decision (Ayık et al., 2013; SMS, 2008). Since businesses do not have precise information about the market price, and the price will not be determined by

* This article is derived from a Ph.D. thesis entitled "Integration of Price Sensitivity Measurement and Quality Cost Management into the Target Costing Process in All-Inclusive System: An Application in a Hotel Enterprise"

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the trial and error method, it is essential to conduct price research to determine the correct price (Grigsby, 2015).

Thanks to price research, business get information on how to price their products, how sales will drop when product prices increase, which market will be protected or lost when price changes, whether price discrimination is necessary or not to increase sales (Lipovetsky et al., 2011). Moreover, as a result of price research, businesses can follow a proactive pricing approach, i.e., they can see how pricing decisions affect buyers' perception of price and their perception of value. In this way, businesses can decide more effectively while increasing prices and making discounts (Monroe and Cox, 2001). However, businesses can increase their profitability by calculating the product/service value through accurate estimation and measurement methods and by setting a price to reflect this value and following a pricing policy (Smith and Nagle, 2002). According to Donatello's (2013) doctoral thesis study, one of the most common price research methods is the Price Sensitivity Measurement (PSM) method. The PSM is an effective method in determining the price for existing products. (Grigsby, 2015).

With the PSM method, the acceptable price range, between the highest and the lowest price range, is determined, and the percentage of customers who want to purchase can be seen within this range. Since the relationship between price, quality and the value perceived by customers is also taken into account while determining the price with PSM, it can be utilized for demand forecasting and product development decisions (Harmon et al., 2007; Lewis & Shoemaker, 1997; Raab et al., 2009a; Raab et al., 2009b). In the hospitality industry, price research is mostly used in the economic benefits (yield management) of pricing decisions, choosing pricing strategy, reference pricing (Parsa and Njite, 2004). This study describes the potential revenue losses, at price points determined by price sensitivity measurement, between actual revenue and potential revenue that can be gained, in terms of yield management.

The Price Sensitivity Measurement

Price sensitivity measurement (PSM), developed by Dutch Economist Peter H. Van Westendorp, is defined as a method that measures the price perception to determine price resistance levels depending on the customers' perceptions of quality related to the product (Travis, 1982). Due to the connection that customers establish between the cost and benefit of the goods/services they want to buy, there are always low and high price thresholds in consumers' minds (Hoffman and Bateson, 2010). Most of the time, customers can give up their purchasing action when they perceive the brand they know as too expensive. On the other hand, if the price of the product is too low, they can doubt its quality-related features (Salamandic et al., 2015). When customers learn more about a product, they can change the acceptable price range. For example; If customers notice the existence of similar alternative offers, the upper

price threshold is lower. However, if customer satisfaction or customer loyalty increases, the upper limit tends to increase. Conversely, if customer satisfaction or customer loyalty decreases, upper price thresholds also decrease (Monroe and Cox, 2001). The PSM method provides tips on understanding how the interaction of price and quality affects customers' perceptions of value and how to change their perceptions of value (Lewis and Shoemaker, 1997).

In the PSM method, the price is determined by asking questions about the products or services from different price perspectives and comparing them. The following four questions are asked within the scope of the method (Chhabra, 2015; Lipovetsky et al., 2011; SMS, 2008; Weiner, 2002; Westendorp, 1976):

1. At what price would you consider the product/service is so cheap that you would have some doubts about its quality, and you would not buy it? (Very cheap)

2. At what price would you consider the product/service is cheap, and you have no doubts about its quality, and you would buy the product/service? (Cheap)

3. At what price would you consider the product/service is expensive, but you would keep buying because of its good quality? (Expensive)

4. At what price would you feel the product/service is too expensive that it is not worth purchasing regardless of its good quality? (Very expensive)

With the PSM analysis, various points are obtained by combining the graphical curves created according to the cumulative values of the answers given to these 4 questions. These are Optimal Price Point (OPP). Point of Marginal Cheapness (PMC), Point of Marginal Expensiveness (PME), Indifference Price Point (IDP), Stress Price Range (SPR) and Range of Acceptable Price (RAP).

Optimal Price Point (OPP): The Optimal Price Point (OPP) is the price point at which the number of customers who perceive the product as very cheap is equal to the number of customers who recognise the product as very expensive. This is generally the recommended price (Hague, 2009). The word "optimal" in the OPP means that consumers have the least resistance to the product price (Westendorp, 1976). So, this point is the ideal price point for the product (Weiner, 2002).

Point of Marginal Cheapness (PMC): An equal number of participants evaluate the price offer as "very cheap - expensive at the Point of marginal cheapness (PMC) (SMS, 2008). PMC represents the lowest limit of the range of acceptable price (Weiner, 2002). Prices below this threshold force customers to question product quality and purchase decisions (Harmon et al., 2003). In this context, when the product underprices from this point, sales may decrease because of doubts about its quality (Lieberman, 2015). Therefore, the operating income will decrease even if the sales volume increases (SMS, 2008).

Point of Marginal Expensiveness (PME): The Point of Marginal Expensiveness is the price point that the customer perceives the product price as too expensive according to the product value (Lieberman, 2015). An equal number of participants evaluate the price offer as "very expensive - cheap" at this point (SMS, 2008). PME represents the upper pricing threshold of the acceptable price range (Weiner, 2002). The prices above this threshold will cause the perceived value to decrease so low that consumers may prefer other products (Harmon et al., 2003). Moreover, a higher price will decrease sales volume and revenue. (SMS, 2008).

Indifference Price Point (IDP) and Indifference Price Percentage (IPP): The indifference price point (IDP) is the price point where the number of customers who perceive the product as cheap is equal to the number of customers who recognise the product as expensive. According to Van Westendorp, the price at this point generally represents either the average price paid by customers in general or the price of a significant market leader product (Hague, 2009). The potential profit will be lost when the product/service price is lower below IDP. On the other hand, more pricing above IDP will cause a decrease in sales volume (Weiner, 2002).

Van Westendorp (1976) states that the indifference price percentage (IPP) can be either so low (e.g. 5-15%) or very high (e.g. 30%). There is an inverse relationship between the indifference price percentage and price awareness. While a low IPP indicates a high price awareness, a high IPP indicates a low price awareness. On the other hand, when testing new products, businesses generally find higher values for the indifference price percentage.

Stress Price Range (SPR): The range between the optimal price point (OPP) and the indifference price point (IDP) is described as the stress price range. Van Westendorp (1976) states that the range between OPP and IDP is short in most cases. He even emphasizes that prices at these two points can be equal. Prolonged stress price range shows that there is some pressure/stress in price consciousness. When the OPP takes place to the left of the IDP or a lower OPP, it means that some customers have high price awareness and prefer a lower price. This situation usually occurs after a significant price increase. Conversely, an OPP higher than the IDP and below the upper price limit indicates that some customers may be willing to accept a price increase (Harmon et al., 2003).

Range of Acceptable Price (RAP): Price limits are described as price points where customers' thoughts become negative, and they may change their attitudes, purchase intentions and behaviours (Harmon et al., 2007). The acceptable price range is the price range between which customers suspect the quality of a brand, and consider it too high. In the prices outside this price range, the customers search for a replacement product/service (Travis, 1982). The price range between the point of marginal cheapness (PMC) and marginal expensiveness (PME) is the acceptable price range (RAP) for a product/service.

The Relationship Between Price Sensitivity Measurement and Yield Management

Besides, yield management is a new management approach, and it is a crucial innovation, especially for service businesses (Netessine and Shumsky, 2002). In service businesses, it is of great importance to manage demand, especially since the airline companies, hotel businesses, cruise ships, restaurants, and entertainment centres have a limited capacity and are not able to increase these capacities in the short term. Also, because the products offered by service businesses cannot wait for a sale in the future, they lose all their value when not sold (Okumuş, 2004). As yield management is based on the principle of increasing revenue with the current capacity, it finds a more prominent place in service businesses (Farrel and Whelan-Ryan, 1998).

Yield management includes price adaptations and sales-related practices to maximize revenue from limited products and services of businesses with a fixed capacity (Koide and Ishii, 2005). Yield management has two essential objectives in terms of hotel businesses. These are determining the room price as to obtain maximum profit in periods when demand exceeds supply, and increasing occupancy by offering average room price in periods when demand is low compared to the amount of supply (Jones and Hamilton, 1992). For this reason, correct pricing has a vital place in yield management. The primary purpose of pricing is to obtain the highest profit and income by selling the products and services at the highest price that the current market segments will accept and are willing to pay (Jones, 2013). In this respect, yield management describes differentiation according to the increase and decrease in demand (Özel et al., 2012).

Price is not only crucial for achieving targeted profit but also for making targeted sales revenue (Blythe, 2005). Although business managers want to sell their business capacity at the highest price as possible, this is rarely applicable (Kimes, 1989). If the price is determined high, it may lead to a decrease in the demand for the business, which results in the termination of sales. On the other hand, when the price is too low, a negative opinion may occur about the product in terms of quality. This situation leads to a decrease in operating income and causes financial loss for the business. Therefore, business managers should set a price that will increase their profitability and take into consideration that determined price is in line with product quality, competitors' product prices, production costs and customers' willingness to pay (Burnett, 2008; Çetiner, 2002; Mirze, 2010).

Yield management provides a balance between demand and price (Kimes, 1989). So, yield management deals with both selling the right product to the right customer at the right time and aiming to achieve a high-profit margin by selling these products to customers who are willing to pay high prices. However, if businesses expect high value-added customers to meet their demands, the product sales period may end. As a result of this, there may be idle capacity, or companies may have to sell at low prices (Bitran and Caldentey, 2003).

In keeping with the yield management theory, the majority of hotels use dynamic pricing (Abrate et al., 2012; Mattila and Choi, 2014). The common subject of yield management and

dynamic pricing is to create the opportunity to increase profits by applying different prices according to customer value perceptions (Jallat and Ancarani, 2008). For example, Abrate et al. (2019) used a new hedonic revenue model on a sample of 21,687 observations, and they found that a higher dynamic price variability leads to higher hotel revenues.

It is now common for hotels to charge different prices for the same room type, depending on the days of the week, duration of stay and prior reservation. Sometimes the same customers are charged different prices by the same hotel for different periods of stay. However, these pricing practices can alienate customers due to the perception of unfairness (Choi and Mattila, 2004). Kahneman et al. (1986) and Kimes and Wirtz (2002) stated that if the price differences are seen as unfair, the business may lose revenue because the customers do not agree to pay. Choi and Mattila (2004) concluded that hotel revenue management practices might lead to a perception of injustice, as a result of their study with 240 participants waiting to board an aeroplane at domestic gates of an airport located in Washington. On the other hand, Emeksiz et al. (2006) highlight that customers who buy rooms at high prices may think that they are being ripped off and therefore, they can change their purchasing decisions to another business. That's why they stress it is essential to understand how customers will react to a wide variety of prices for the same room. Also, Hanks et al. (2002) emphasise that customer groups' behaviour patterns and willingness to pay should be taken into account when making price differentiation. Yield management principally suggests segmenting customers according to their price sensitivity and willingness to pay, and then pricing. Despite unfairness concerns, Choi and Mattila (2004) pronounce that the question of how hotel yield management practices affect customer responses remains unanswered. In the study, price sensitivity measurement method has been proposed to solve these constraints in yield management.

The price sensitivity measurement method (PSM) focuses on finding an acceptable price as a quality indicator. PSM also takes into account consumers' both low-quality concerns due to low prices and concerns about very high pricing (Lipovetsky et al., 2011). Moreover, the method focuses on customer value perceptions which give consumers direct information on the pricing decision (Harmon et al., 2007). It assumes that consumers are willing to pay more for a better quality product (Weiner, 2002). So the method eliminates the sensitivities of the potential demand change that may occur as a result of pricing in yield management. Because in the PSM method, products are priced by taking into consideration factors such as price sensitivity, willingness to pay and value perception of customers. In addition to this, the method provides information about minimum and maximum prices which can be determined based on demand changes. Thanks to the method, businesses price their products more effectively and use their limited capacity more efficiently, so that they maximize the yield.

Table 1
Literature Review

Author/s	Date	Title	Sample	Findings	Implications
Lewis and Shoemaker	1997	Price-Sensitivity Measurement: A Tool For The Hospitality Industry	The association meeting market	The study showed that the PSM method could be applied to the hotel industry.	Instead of using gut feeling or trial and error to determine the right price for products/ services, a hotel/ restaurant owner can use the PSM method, a simple survey tool to pre-measure the price sensitivity of customers.
Harmon et al.	2003	Incorporating Price Sensitivity Measurement İnto The Software Engineering Process	96 small-to-medium sized contractors	The business should first develop the labour monitoring module for faster financial gain.	The PSM method provides product developers with the ability to quickly evaluate the acceptable price range, indifference points, and optimum pricing points for any software configuration.
Raab et al.	2009	Activity-based pricing: can it be applied in restaurants?	Hong Kong buffet restaurant	The study showed that although guests are relatively price-insensitive, drastic measures are needed to make the restaurant profitable by reducing costs.	Utilizing activity based pricing (Activity-based costing and the PSM method) allows a restaurant truly to understand both its operating cost structure and the price perceptions of it guests.
Raab et al.	2009	Price-Sensitivity Measurement: A Tool For Restaurant Menu Pricing	Hong Kong buffet restaurant	The results reveal price ranges that represent real value for dinner buffet customers.	Restaurant managers can obtain information about menu prices directly from their customers through a relatively simple survey.
Roll et al.	2010	Innovative approaches to analyzing the Price Sensitivity Meter: Results of an international comparative study	300 customers from the B2B sector	As a result of the study, the indifference price point was found different in three different countries. Also, they found that the price that maximizes turnover and the profit differs from indifference price.	Authors proposed a model to use the PSM method to maximize profit and income.

Salamandic et al.	2014	Price sensitivity measurement depending on brand awareness: a case of Ziede brand	All girls and women in Lithuania from 11 to 35 years old	The results of the study confirm that the optimal price determined differs between brand-conscious and unaware customers.	The optimal price determined for brand-conscious consumers protects the brand value, and the business can make additional profit.
Ceylana et al.	2014	Value Based Pricing: A Research on Service Sector using Van Westendorp Price Sensitivity Scale	200 students of Usak University	The study showed that the price sensitivity of the university students on private dormitories is high.	PSM method is used as a value-based pricing method.
Chhabra	2015	Determining the Optimal Price Point: Using Van Westendorp's Price Sensitivity Meter	Females within the age group of 20–35 years,	The optimal price point determined as Rs.190 for 250 ml Vivel Cell Renew.	PSM analysis can provide the first indications of optimal prices. However, the method needs to be changed and completed to come up with concrete recommendations in terms of price management.
Desmet	2016	Effectiveness of measures assessing response to price information	Internet panel participants who are responsible for shopping for their household.	Multiple questions (price decisions and repeated random discrete choices) increase interest in price information and reduce bias.	Price judgments provide reliable information about consumers' reactions to prices.
Hidalgo	2017	Market Potential of Pasteurized Coconut Water in the Philippine Beverage Industry	The beverage consumers	In the study, Pasteurized Coconut Water was subjected to price analysis to measure price sensitivity according to consumer price expectations and threshold perceptions.	In cases that may affect the profitability of the business, the price should be within the acceptable price range. Otherwise, the company may experience the consequences of reversing the purchasing decisions of the consumer.
Khandker and Joshi	2019	Price determination for 4G service using price sensitivity model in India	The students of an internationally accredited business school in a university town	The PSM identifies the acceptable range and the best price points. The estimates obtained are similar to the current prices of data packages in the same telecom circle, confirming the fit of the PSM.	For practitioners and academics, this study reveals the relevance and utility of a direct approach of the PSM to estimate individuals WTP' for a new product/service.

Dominique-Ferreira and Antunes	2020	Estimating the price range and the effect of price bundling strategies An application to the hotel sector	Customers from three- and five-stars hotels	Bundling strategy results reveal that five-star customers are less susceptible to mixed-leader bundling. Regarding mixed joint bundling sales, managers can increase sales through bundling strategies if they choose an attractive service (e.g. restaurants).	The findings help hotel managers understand different price sensitivities according to hotel typology. Managers can manage prices without risking losing market share or revenue. The results help managers decide what bundling strategies they can create and the services to include to achieve the highest profitability.
Dong et al.	2020	Urban households' purchase intentions for pure electric vehicles under subsidy contexts in China: Do cost factors matter?	Chinese urban households from eight economic regions (or 30 provinces)	The acceptable price range for all-electric vehicles for urban families is between 65,000 CNY and 120,000 CNY.	PSM method has been associated with cost and purchase intention.

As can be seen in Table1, There are studies related to the price sensitivity measurement (PSM) method applied in different sectors for both existing and new products. Harmon et al. (2003) used the PSM method to determine the most appropriate price point and price threshold limits depending on the quality perceptions of a new software product. Salamandic et al. (2014) and (2015) used the PSM method to measure the price sensitivity of existing and new cosmetic products according to the brand awareness of customers in their studies. Similarly, Chabbra (2015) used the PSM method in pricing a cosmetic product. Khandker and Joshi (2019) used the PSM method to set a price for a telecom company's 4G service in India. Dong et al. (2020) used the PSM method to measure urban households' price preferences for a new product, purely electric vehicles.

In the hospitality industry, the PSM model was first used in 1988 at Taco Bell Fast Food to create a menu based on value-based pricing (Lewis & Shoemaker, 1997). Similarly, Ceylana et al. (2014) used the PSM method as a value-based pricing tool to examine university students' price perceptions about private dormitories. Also, there are studies by Raab et al. (2009a) and (2009b) in the pricing of an evening buffet meal in a restaurant in Hong Kong. Moreover, Hidalgo (2017) used the PSM method to determine the ideal price for Pasteurized Coconut Water according to consumer price expectations and threshold perceptions. As a result of the literature review on PSM, no research was found regarding the determination of the room price in the all-inclusive system. However, there are studies by Dominique-Ferreira and Antunes (2020) in estimating the price range and the effect of price bundling strategies in the hotel sector and by Lewis and Shoemaker (1997) in determining the price of the room for the planned holiday on congress organization companies.

Unlike their classic interpretation of the PSM method, Roll et al. (2010) first time interpreted with a new approach to maximize profitability and revenue. As a result of the study, the indifference price point was found different in three different countries. Also, they found that the price that maximizes turnover and the profit differs from indifference price. With this study, the relationship between price sensitivity measurement and yield management was investigated for the first time in the hospitality industry. In their studies, Dominique-Ferreira and Antunes (2020) also state that thanks to the PSM method, hotel managers have the opportunity to manage prices without the risk of loss of market and revenue. Also, they specified that the PSM results help managers decide an appropriate product to achieve the highest profitability. Similarly, Harmon et al. (2003) suggested that the enterprise should develop the labor monitoring module first for faster financial gain. Also, Salamandic et al. (2014) stated that the business would gain higher profits by turning to brand-conscious customers. Therefore, we can say that the results obtained in the PSM method can be used in managing demand and pricing decisions to maximize yield.

Methodology

A case study was carried out in a 5-star hotel business in Aydın. The hotel business provides accommodation in an all-inclusive concept and has 245 rooms and 650 beds capacity in total. The hotel business provides food and beverage service in a total of six units, including two restaurants, three bars, and one disco. The hotel has one outdoor pool, one children's pool, one indoor pool, and one aquapark. Also, the hotel has three meeting rooms. Within the all-inclusive concept, as an accommodation service, towel change is made once a day, beach towel change is free, linen change once every three days and room cleaning is done every day. There is a balcony, bathtub, hair dryer, direct telephone, wake-up service, safe deposit box, satellite TV, internet connection, split air conditioner, minibar, electronic lock system, fire alarm and 24-hour room service in the hotel rooms. Within the concept, customers can use the pools (outdoor, indoor and children's pool) and aquapark free of charge. Also, breakfast, lunch, dinner, snack, tea time and night soup are served free of charge. Besides, all drinks except imported alcoholic beverages are provided free of charge. The beverage service ends at 23:00, and after this time, drinks are sold as extra. Free activities and services are; Turkish bath, sauna, fitness centre, kids club, all animation activities, beach towels, sunbeds, sun umbrellas, baby beds, baby table chairs and ice cream time (for children).

In the study, a questionnaire was conducted to determine price resistance levels, price threshold limits, price sensitivity levels and price perceptions based on the all-inclusive pension service quality perceptions of the tourists visiting the hotel business. Also, an interview was performed with the accounting manager and front office manager about the room prices determined.

As the case study method was used in the research, the research was limited to a hotel business. Also, the study was limited to July and August 2017. In the hotel business, it occurred a totally 15,968 overnight stays in July, and 16,917 overnight stays in August. Since it was not possible to reach the whole population in terms of both cost and time, sampling was used in the research. While calculating the sample, the number of overnight stays was taken into consideration, and the number of samples was determined by using the hypothetical sample size table (Balcı, 2011) for the different sized population. According to the table, the number of samples for each month was determined 381, with a 5% margin of error. The convenience sampling method was selected from the non-probability sampling methods. In total, 450 questionnaires were conducted for July and August. Due to the incorrect questionnaire form and some of the questions that were not answered, 398 for July and 386 for August available questionnaires were obtained.

The questions developed by the Dutch economist Peter H. Van Westendorp (1976) were used to measure price sensitivity. Four questions were posed in this study to implement the PSM:

1. In this hotel, at what price would you consider the all-inclusive room price per person is too cheap so that you would question its quality and would not purchase it?

2. In this hotel, at what price would you consider the all-inclusive room price per person is cheap however you have no doubts about its quality and you would purchase it?

3. In this hotel, at what price would you think the all-inclusive room price per person is kind of expensive, but still worth buying because of its good quality (rooms, foods, activities etc.)?

4. In this hotel, at what price would you feel the all-inclusive room price per person is so expensive that it is not worth purchasing in this hotel regardless of its good quality (rooms, foods, activities etc.)?

The responses obtained from the four open-ended questions have been combined with the graphical curves generated depending on the cumulative frequencies, and the intersection points have been calculated. There are 5 units between price intersection values. Considering the intersection points for the two months, Point of Marginal Cheapness (PMC), Point Of Marginal Expensiveness (PME), Optimal Price Point (OPP), Indifference Price Point (IDP), Indifference Price Percentage (IPP), Range of Acceptable Price (RAP) and Stress Price Range (SPR) have been calculated. All prices displayed in the graphs are expressed in Turkish Liras. So, the prices stated in the form of currency in the questionnaire form was converted to TL. The buying rate of exchange declared by the Central Bank of the Republic of Turkey was taken into account. Then, the average of these exchange rates was calculated for July and

August. The amounts converted to TL was rounded up or down to the nearest whole TL value (0-5). The exchange rate conversion rates for July were 3,5599 for USD, 0,0593 for RUBLE, 4,0914 for EURO and 4,6140 for GBP. And, the exchange rate conversion rates for August were 3,5125 for USD, 0,0585 for RUBLE, 4,11436 for EURO and 4,5512 for GBP. In terms of validity, the results obtained by the PSM method were discussed with the accounting manager and compared with the current sales prices of the hotel.

Findings and Discussion

Price Sensitivitiy Measurement (PSM) Results

Under this title, results take place about price resistance levels, price threshold limits, price sensitivity levels and price perceptions based on the room quality perceptions of the tourists visiting the hotel business.

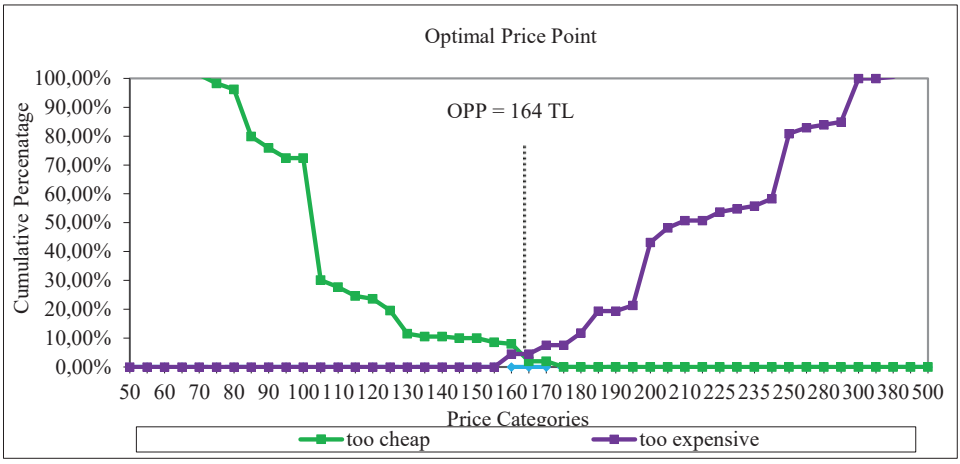

Figure 1. Optimal Price Point For All Inlusive Pension Per Person (July)

Figure 1 depicts the optimal price point (OPP) for all-inclusive pension per person in July. OPP was determined as 164 TL per person in July.

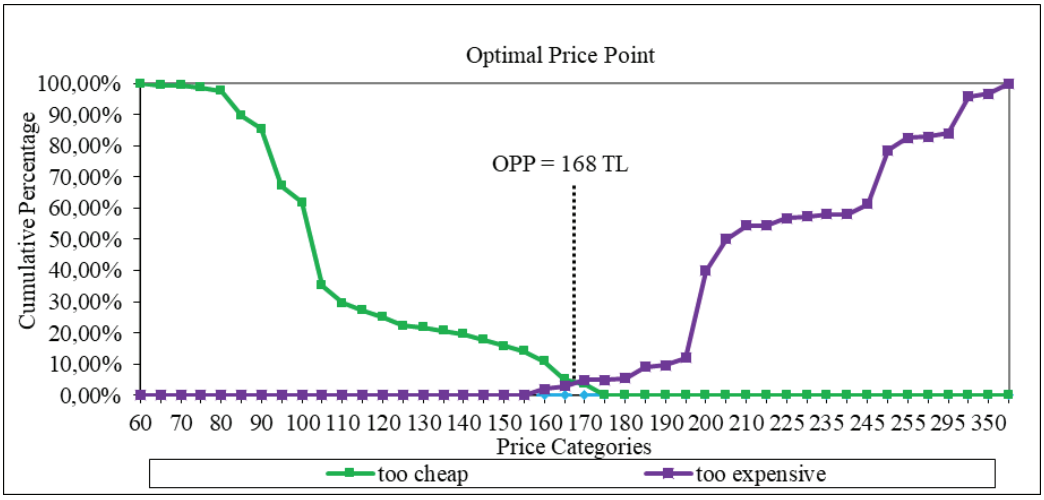

Figure 2. Optimal Price Point For All Inlusive Pension Per Person (August)

Figure 2 depicts the optimal price point (OPP) for all-inclusive pension per person in August. OPP was determined as 168 TL per person in August.

The results illustrate that an optimal price point (OPP) which is much more than the actual room sales price per person. In terms of validity, the results obtained by the PSM method were discussed with the accounting manager and compared with the current sales prices of the hotel. During the meeting with the accounting manager; he stated that the optimal price was at market value and the surplus between the actual average selling price and OPP was due to discounts provided to the timeshare vacation customers and commission paid to travel agencies in particular. In this context, he emphasized that a 35-40% discount applied to timeshare vacation customers decreases the average actual sales price of the room. Also, he emphasized that as a result of the commission rates, the transfer, guidance fees and profit margin added by the travel agencies and tour operators, all-inclusive rooms per person were sold around 170 TL-180 TL and this caused the surplus. In addition to this, during the interview with the front office manager, he stated that they offer a 10-15% discount for repeat guests depending on silver and gold customer classification.

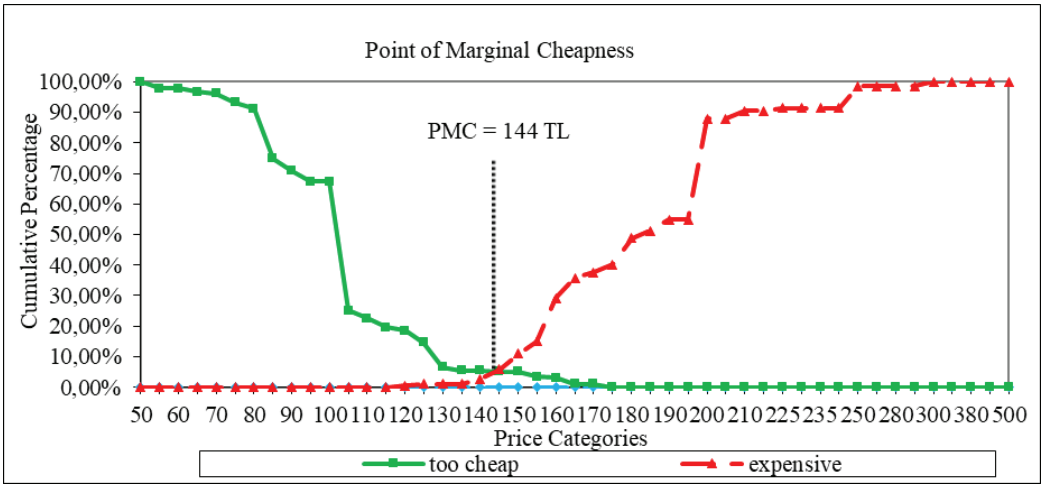

Figure 3. Point of Marginal Cheapness For All Inlusive Pension Per Person (July)

Figure 3 depicts the point of marginal cheapness (PMC) for all-inclusive pension per person in July. PMC was determined as 144 TL per person in July.

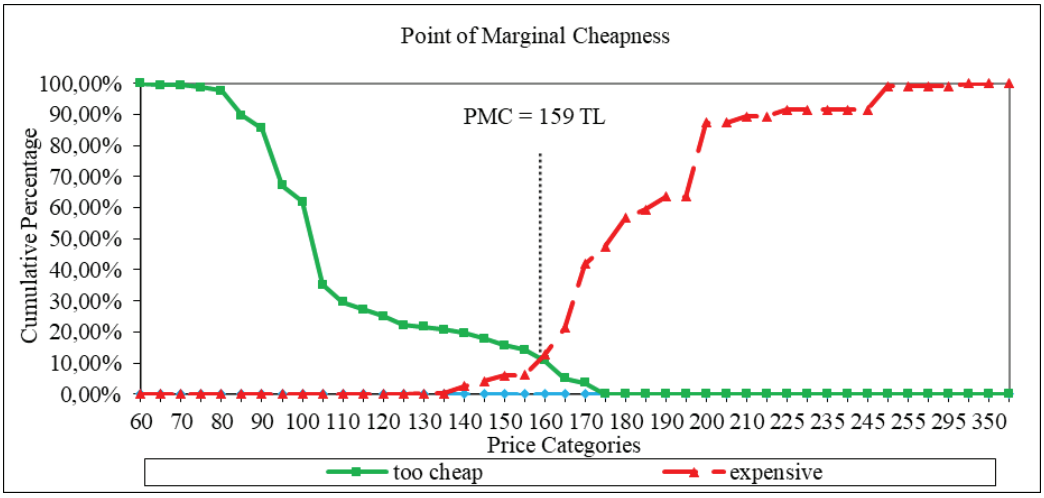

Figure 4. Point of Marginal Cheapness For All Inlusive Pension Per Person (August)

Figure 4 depicts the point of marginal cheapness (PMC) for all-inclusive pension per person in August. PMC was determined as 159 TL per person in August.

All-inclusive pension per person price has not to decrease below PMC points to ensure that customers do not doubt the quality of service provided and that sales and sales revenues of the entity do not decrease. The indifference price point (IDP) for all-inclusive per person

was determined 155 TL for July (Figure 7) and 165 TL for August (Figure 8). Thus, it can be assumed that customers perceive the price range between 144 TL and 155 TL for July, and between 159 TL and 165 TL for August as cheap but without significant doubts about the quality of the service provided.

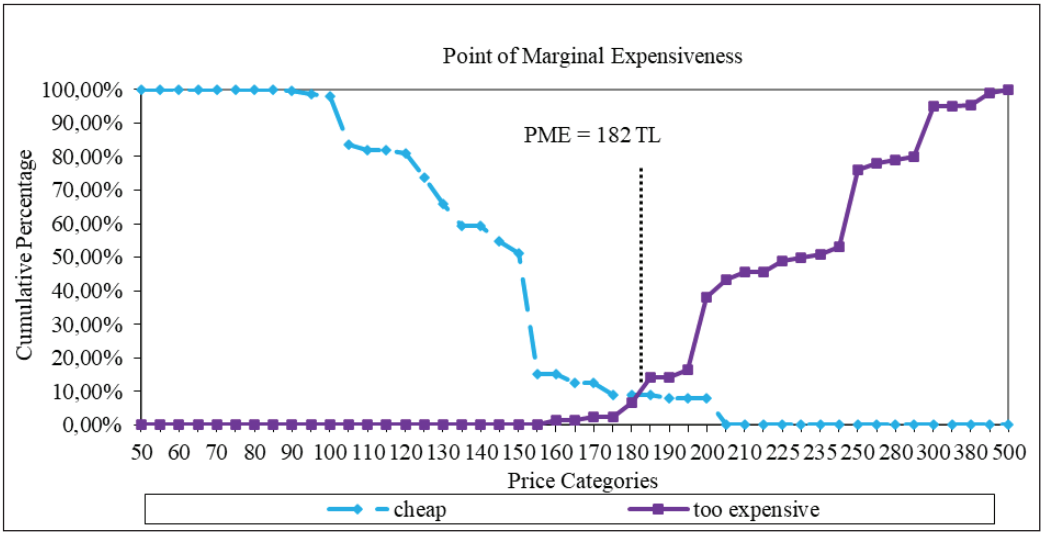

Figure 5. Point of Marginal Expensiveness For All Inlusive Pension Per Person (July)

Figure 5 depicts the point of marginal expensiveness (PME) for all-inclusive pension per person in July. PME was determined as 182 TL per person in July.

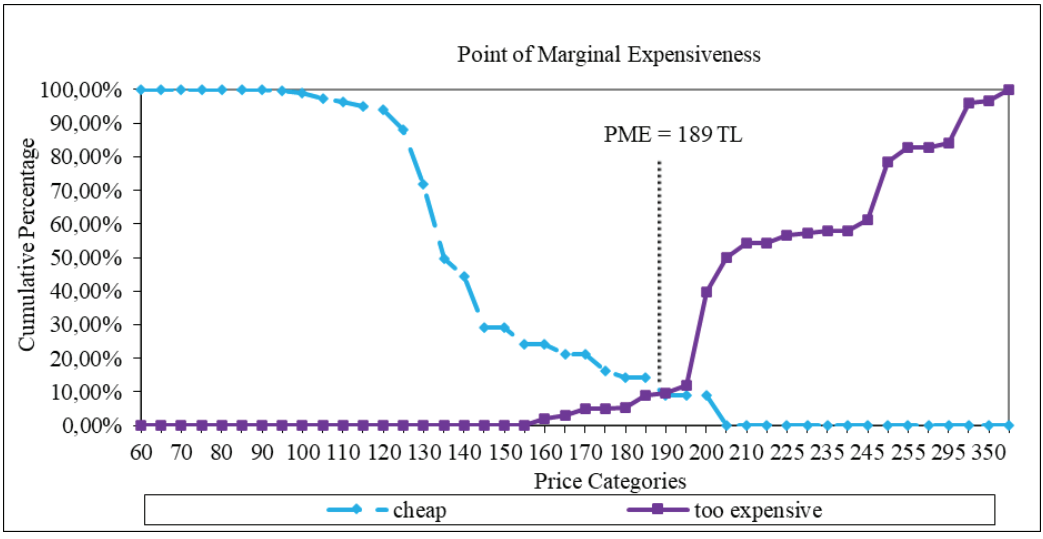

Figure 6. Point of Marginal Expensiveness For All Inlusive Pension Per Person (August)

Figure 6 depicts the point of marginal expensiveness (PME) for all-inclusive pension per person in August. PME was determined as 189 TL per person in August.

Even if the businesses offer high service quality to customers, they should not set a price above PME points in order not to decrease sales and sales revenues, as customers can give up the decision to purchase. Also, the indifference price point (IDP) for all-inclusive per person was determined 155 TL for July and 165 TL for August. Although customers perceive the price range between 155 TL and 182 TL for July, and between 165 TL and 189 TL for August as expensive, they still recognise that it is worth it for the quality of service they receive.

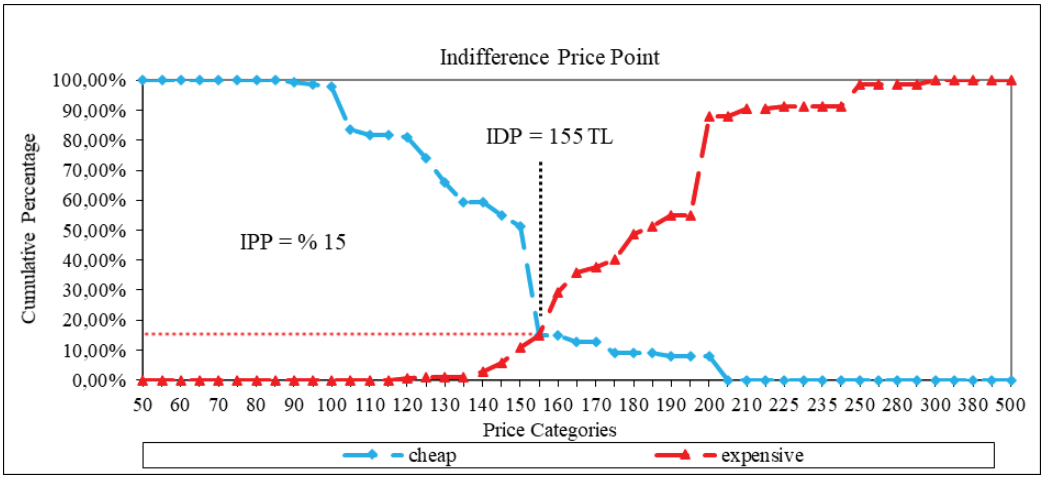

Figure 7. Indifference Price Point and Indifference Price Percentage For All Inlusive Pension Per Person (July)

Figure 7 depicts the indifference price point (IDP) and indifference price percentage (IPP) for all-inclusive pension per person in July. IDP was determined as 155 TL per person and IPP was determined as %15 in July. According to IPP, the customers who prefer to stay in July have a medium-level price awareness.

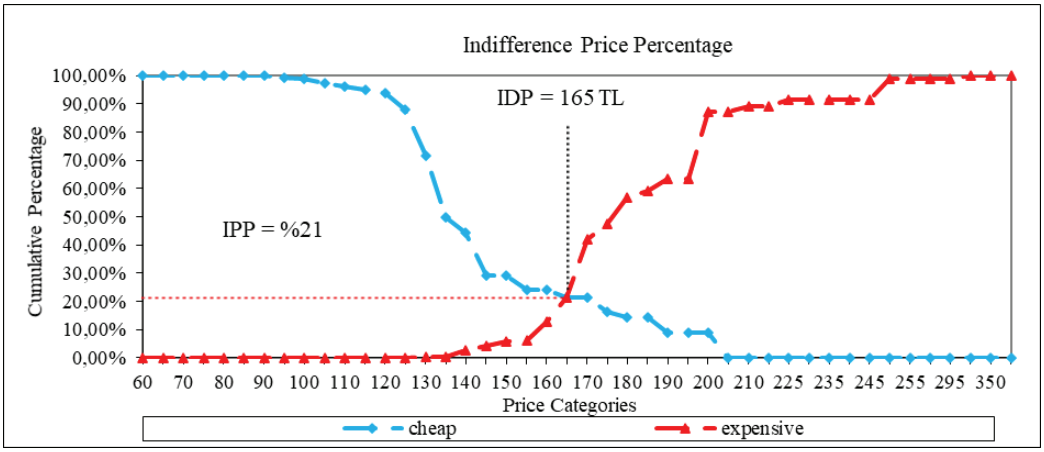

Figure 8. Indifference Price Point and Indifference Price Percentage For All Inlusive Pension Per Person (August)

Figure 8 depicts the indifference price point (IDP) and indifference price percentage (IPP) for all-inclusive persion person in August. IDP was determined as 165 TL per person and IPP was determined as %21 in August. According to IPP, the customers who prefer to stay in August have a low-level price awareness.

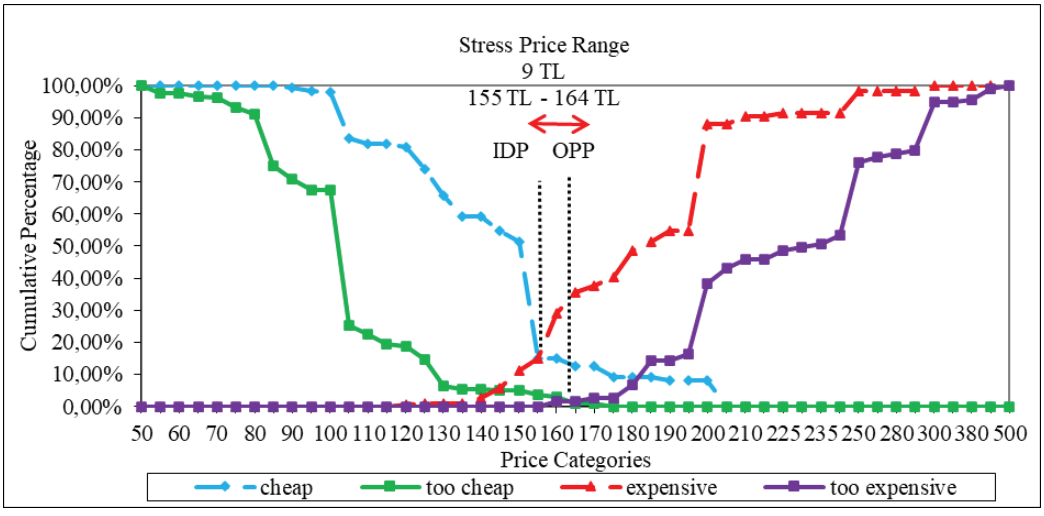

Figure 9. Stress Price Range For All Inlusive Pension Per Person (July)

Figure 9 depicts the stress price range (SPR) for all-inclusive pension per person in July. SPR was determined as 9 TL in July.

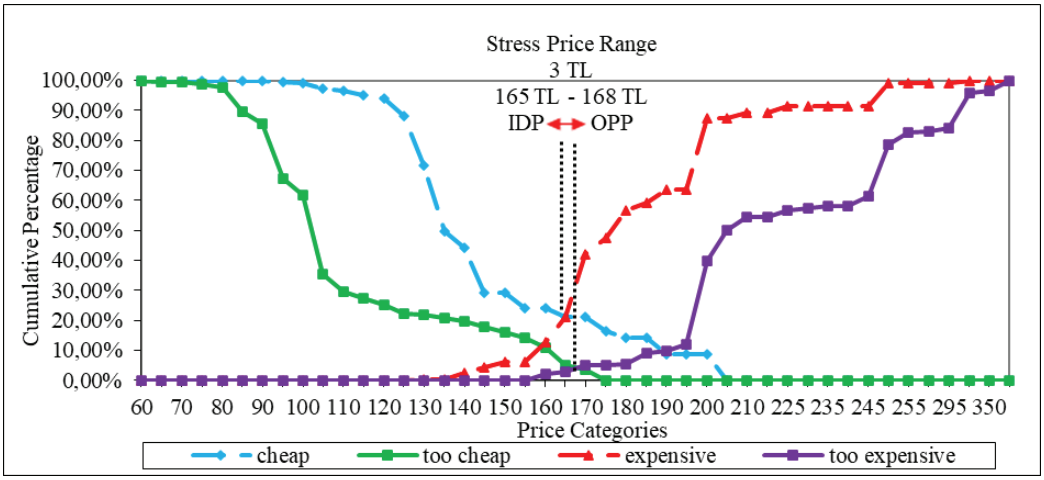

Figure 10. Stress Price Range For All Inlusive Pension Per Person (August)

Figure 10 depicts the stress price range (SPR) for all-inclusive pension per person in August. SPR was determined as 3 TL in August.

Both in July and August, OPP is on the right side of IDP and higher than IDP. This result means that the pressure on the price is low, and customers can pay more than the price at the IDP point. Also, the low price range of stress compared to the acceptable price range indicates that the price sensitivity of the customers is low.

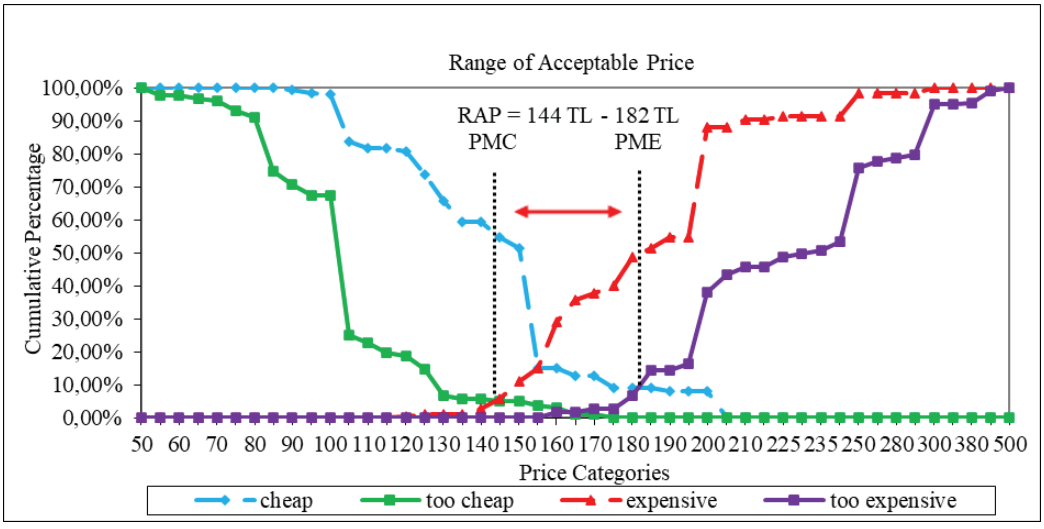

Figure 11. Range of Acceptable Price For All Inlusive Pension Per Person (July)

Figure 11 depicts the range of acceptable price (RAP) for all-inclusive pension per person in July. According to the graphic, the business can set a minimum price of 144 TL and a maximum of 182 TL for all-inclusive per person.

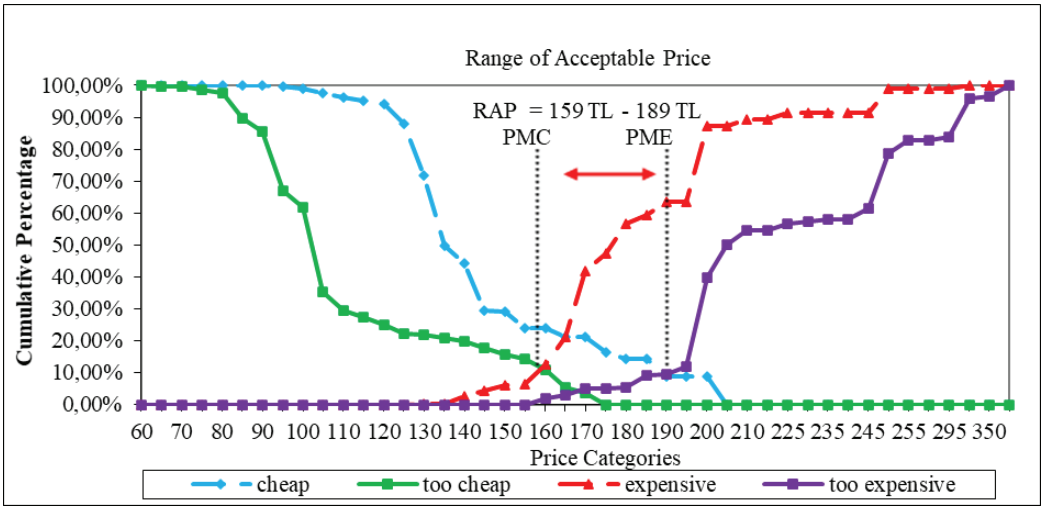

Figure 12. Range of Acceptable Price For All Inlusive Pension Per Person (August)

Figure 12 depicts the range of acceptable price (RAP) for all-inclusive pension per person in August. According to the graphic, the business can set a minimum price of 159 TL and a maximum of 189 TL for all-inclusive per person.

The shorter acceptable price range depicts higher price sensitivity (Lewis and Shoemaker, 1997). In the study, the range of acceptable price is determined 38 TL for July and 30 TL for August. The wide range of acceptable price indicates that customers' price sensitivity is low.

Potential Room Revenue Losses Calculated for All Points

Under this title, results take place about potential room revenue loss calculated for all points. Table 2 shows the room revenues in the hotel business in July and August, the number of overnight stays, the current room sales prices, PSM analysis results and the potential room sales revenue losses calculated according to the all points determined. All-inclusive services are billed together with the overnight stay and subject to 8% VAT within the scope of the overnight stay in all-inclusive hotels (Kızılot, 2008). Therefore, the VAT rate was taken 8% in the room sales price calculations.

Table 2
Potential Room Revenue Losses Calculated for All Points

Annual Report Data	**July**	**August**
a) Room Revenues	1.797.579,66 TL	1.924.609,08 TL
b) Overnight Stays	15.968	16.917
c) Actual Room Rate For All Inclusive Pension Per Person (%8 VAT Included) (a/b)*1,08	121,58 TL	122,87 TL
PSM Analysis Results	**July**	**August**
d) Optimal Price Point (OPP)	164,00 TL	168,00 TL
e) Point of Marginal Cheapness (PMC)	144,00 TL	159,00 TL
f) Marginal Expensiveness (PME)	182,00 TL	189,00 TL
g) Indifference Price Point (IDP)	155,00 TL	165,00 TL
h) Indifference Price Percentage (IPP)	%15	%21
i) Stress Price Range (SPR)	155 TL - 164 TL	165 TL-168 TL
j) Acceptable Price Range (RAP)	144 TL – 182 TL	159 TL – 189 TL
Potential Room Revenue Losses	**July**	**August**
k) For Optimal Price Point (OPP) [b*(d-c)]/1,08	627.187,56 TL	706.911,31 TL
l) For Point of Marginal Cheapness (PMC) [b*(e-c)]/1,08	331.483,85 TL	565.936,31 TL
m) For Point of Marginal Expensiveness (PME) [b*(f-c)]/1,08	893.320,09 TL	1.035.852,97 TL
n) For Indifference Price Point (IDP) [b*(g-c)]/1,08	494.120,89 TL	659.919,64 TL

According to Optimal Price Point (OPP), the potential room income loss is 627.187,56 TL for July, and 706.911,31 TL for August. The price at the OPP point is the ideal price point according to the quality perceived by the customers, and the customers are willing to pay the price at this point, so the hotel business has lost a large amount of revenue. On the other hand, this pricing does not create any quality and idle capacity concerns.

According to the point of Marginal Cheapness (PMC), potential room sales revenue loss is 331.483,85 TL in July and 565.936,31 TL in August. In other words, the room sales revenues may increase at least as much as these amounts. Also, in terms of yield management, it can be said that the prices at the point of marginal cheapness will maximize the customer turnover rate. Although the occupancy is low, setting a price below 144 TL in July and 159 TL in August may lead to a negative opinion on the quality of the service offered and result in lower operating revenues. Also, this may damage the brand value of the business. Therefore, pricing should be made within the specified price range (144-155 TL in July and 159-165 TL in August) even if occupancy decreases.

According to the Point of Marginal Expensiveness (PME), potential room sales revenue loss is 893.320,09 TL in July and 1.035.852,97 TL in August. So, room sales revenues may increase at this maximum amount. In other words, the prices at the point of marginal expensiveness will maximize the revenue. Also, pricing can be made up to 182 TL in July and 189 TL in August in periods of high occupancy in terms of yield management.

According to the Indifference Price Point (IDP), potential room sales revenue loss is 494.120,89 TL in July and 659.919,64 TL in August. In other words, room sales revenues may increase at this average amount. In terms of yield management, customers will not show purchasing resistance, as the prices at this point provide information about the market price and comply with the reference price in the minds of customers in terms of willingness to pay.

Table 2 indicates that the hotel business lost room revenue at all points calculated. According to the interviews, the loss of income was due to the discounts provided repeat customers and timeshare vacation customers, and especially the commission paid to the agencies.

Travel agencies get a commission per customer from all-inclusive hotel businesses like other board types (Üngüren and Cengiz, 2009). The commission rate is generally 10% (İçöz, 2001). But, the commission rate varies between 10-20% in another source (Swain, 2014). However, especially summer resort hotels are selling their rooms to tour operators in a block selling and discounted in advance depending on the occupancy to guarantee their occupancy (Emeksiz and Yolal, 2013). Thus, tour operators provide a 25%-60% discount compared to the regular price (İçöz, 2001). But, tour operators also pay commissions to travel agencies that mediate their sales. Generally, tour operators pay 10% commission to wholesaler travel agencies and 15% commission to retail travel agencies (Ahipaşaoğlu, 2002). Also, hotels pay commissions for rooms sold through online sales channels such as Expedia, Booking, and Agoda. For example, according to a statement released by the online hotel reservation portal Booking.com, it gets 15% commissions from hotel bookings through the website in Turkey. Moreover, Booking.com has stated that this commission rate is the lowest one (Hürriyet, 2017).

Today, many travel agencies offer their customers various services such as reservations, tour sales, ticket sales over the internet. Thus, they can reach more audiences without the time and environment limitation (Ansen and Fırat, 2009). The Turkish Tourism Investors Association (TYD) Chairman Murat Ersoy has stated that the online hotel reservation portal commission demanded from the hotels in Istanbul reaches to the level of 50%. He also has stated that these portals not only ring alarm bells but also have an extensive coverage by allocating a budget over $ 1 billion only research and development. Additionally, he has emphasized that unless they make provision against these portals, the portals will get the level of 50% the reservation share within five years (Tourexpi, 2016).

Markus Luthe, CEO of The German International Hotel Association (IHA), has pointed out the monopolization of online distribution channels such as Booking and Expedia on hotels. He has stated that the commission rates of 8-15% currently, but it will increase to 40% and even these rates are applying in Germany. He also stated that as the commission rates increase, the visibility of the hotels on these sites increases and therefore some hotels give commissions up 40% to increase visibility. Also, these sites affect the room prices in hotels

and cause monopolization by setting current prices. Besides, there are notably lawsuits filed against online violations and monopolization in countries such as Germany, England and France (Daş, 2014).

According to the 2016 report submitted by the Priceline Group, which the Booking.com is affiliated to, to U.S. Securities and Exchange Commission (SEC); the company's net profit for 2016 is approximately 2 billion 135 million dollars (Hürriyet, 2017). Additionally, according to the instant survey conducted to participating hotels in the "travel, technology and digital marketing in hotels" event, it has been determined that the annual commission paid by participating hotels to online travel agencies is over 400,000 TL on average. According to the same survey results; the rate of the booking received by the hotels' web sites is below 10%. As a solution, Erhan Kaya, the president of Hotel Linkage, has emphasized that the hotel has increased its website booking ratio to 35% with its Direct Booking Suite application. In this context, he has suggested that if they make the necessary investments on their web sites, they could reduce the commission costs by selling in the web sites (TurizmGünlüğü, 2017).

If reservations are received through hotels' websites and reservation portals, the commissions paid to travel agencies will decrease. So hotel businesses will gain a competitive price advantage by reducing the cost (Ansen and Fırat, 2009). Therefore, the websites should be designed as user-friendly in terms of content, visuality, and ease of use. Also, hotel managers ought to establish a relationship which will make guests feel special themselves, send a thank-you mail to the guests who make a direct booking, and make a discount to the repeat guests (TurizmGüncel, 2015). Besides, if the hotel managers provide information about room pricing practices to customers who make reservations from hotel websites, customers' perception of price fairness increases, thus increasing their willingness to pay. For example, Intercontinental Hotel Group encourages its customers to book on the hotel's website, guaranteeing the best available rate (Choi and Mattila, 2004).

Since hotel products are not frequently purchased, internal reference price information becomes less accessible in the minds of the customer. Hence, they mostly consider the external reference price of the competitors in their price decisions. Unlike third-party intermediaries (e.g. Expedia.com, Orbitz.com and Travelocity.com), a hotel website does not compile competing for hotel prices so that we can draw the attention of hotel customers from an external reference price of the competitors. Thus, there are no conflicts about price unfairness in the minds of customers (Choi and Mattila, 2004; Karande and Magnini, 2011).

In addition to their web sites, hotel businesses should reach customers by using all social media channels. Also, the TripConnect application on the Tripadvisor website encourages the customers to purchase directly. Besides, the online booking manager should be employed in businesses to increase the visibility and online sales of the hotel by using global distribution channels such as Amadeus, Galileo, Saber, and Worldspan (TurizmGüncel, 2015). Alterna-

tively, hotel managers ought to understand customer arrival sources and work with online travel agencies. But travel agencies should not be allowed price setting and restrictions and should establish a legal framework. The relevant legislation is going to be established in Europe within 3 years (Daş, 2014).

A new reservation portal which can be integrated into small search engines can reduce commission rates from 50% to less than 10% (Tourexpi, 2016). Besides, Protel Online, developed by Protel, offers internet booking engine, channel manager and global distribution system. With the internet booking engine, hotel businesses can get reservations through their websites without the need for any intermediaries and paying commissions. Through the channel manager application, hotel managers can make price updates quickly, prevent reservation conflicts and overbooking. With the global distribution system, hotel businesses can join in the pool of all intermediary companies in the sector (Tourismtoday, 2016).

In summary, hotel businesses can reduce the commission costs by increasing their sales by developing their web sites, creating a customer loyalty program, employing an online reservation manager, participating in global distribution systems, establishing a common portal or benefiting from the automation systems developed as an alternative.

Conclusions, Implications and Limitations

This study showed that the hotel business lost room revenue at all points calculated. The hotel business suffered a potential loss of 35-40% because of the high occupancy rate in July and August. Also, the hotel business could possibly gain room sales revenues as a minimum of 331.483,85 TL and a maximum of 893.320,09 TL in July, and a minimum of 565.936,31 TL and a maximum of 1.035.852,97 TL in August. Thus, the pricing policies of the hotel business were set low enough to harm the negative quality perception and brand value.

According to the interviews, the loss of income was due to the discounts provided for repeat customers and timeshare vacation customers, and especially the commission paid to the agencies. The hotel business could have room sales revenues much more than the actual room sales revenues, especially if the travel agency commission expenses can be reduced. The study has both practical and theoretical implications.

Practical Implications

In terms of practical implications, the practitioners (hotel managers) may use the PSM method in determining the price threshold limits, identifying the most suitable room price depending on the customers' quality perceptions and willingness to pay. Also, the practitioners (hotel managers) can use the price points determined by the PSM method in yield manage-

ment in a way that maximizes the customer turnover rate or maximizes profit by taking into account the brand value and capacity utilization rates of the hotel businesses.

It is inevitable for hotel businesses to use an intermediary in sales. However, travel agency commission expenses can be reduced. In this regard, the websites should be designed as user-friendly in terms of content, visuality, and ease of use. Also, the practitioners (hotel managers) should make a discount to the repeat guests, establish a special relationship with guests who make a direct booking and send a thank-you mail after the reservation. In addition to web sites, the practitioners (hotel managers) need to reach customers by using all social media channels. Besides, the practitioners (hotel managers) should employ an online booking manager. Also, the practitioners (hotel managers) should use the TripConnect application on the Tripadvisor website, establish a common portal or benefit from the automation systems developed as an alternative. Moreover, it is necessary to understand the sources of customer arrival, to work with online travel agencies if needed, but not to allow price setting and restrictions and to establish a legal framework.

When consumers know more information about a product, price threshold limits, and price perceptions will change. Besides, if customer satisfaction or customer loyalty increases, price threshold limits will show a tendency to increase. Therefore, practitioners (hotel managers) should follow policies that increase customer satisfaction and improve quality. Also, practitioners (hotel managers) should conduct price research to understand customer value perceptions correctly and make accurate pricing. Furthermore, when customers know more information about pricing practices, perceptions of price unfairness will change. So, practitioners (hotel managers) should provide information about room pricing practices to customers who make reservations from hotel websites.

Theorotical Implications

In terms of the theoretical implications of the study, price is a criterion indicating the willingness to pay for the product/service for potential customers. Today the tourists have a high price sensitivity, especially in terms of hotel businesses. Thus, the willingness to pay and price sensitivity should be taken into consideration when making a pricing decision. Also, the customers are primarily looking for signs of product/service quality in price, so the wrongly adjusted product/service price can affect the decision to buy. On the other hand, customers may pay more for the product/service according to their perceived value. In the research, price sensitivity measurement (PSM) method is used to solve such constraints and problems.

The PSM method is a simple survey tool to pre-measure the price sensitivity of customers and provide reliable information about consumers' reactions to prices. Instead of using a gut feeling or trial and error to determine the right price for products/services, a hotel/restaurant

owner can use the PSM method for pricing without risking losing market share or revenue.

Since pricing is made by taking into consideration factors such as price sensitivity, willingness to pay and perception of value by price sensitivity measurement method, it eliminates the possible demand change sensitivity and price unfairness which may occur as a result of pricing in terms of yield management. The method also provides information about minimum and maximum prices which can be determined based on demand changes. On the other hand, hotel businesses can determine the optimal price by depending on the quality and value perception of the customers; thus they can use their limited capacity more efficiently so that they can maximize yield.

Limitations and Further Research

The main limitation of the research is that the analysis was carried out in a single hotel business and on a small sample size. The content of an all-inclusive pension may differ between hotel businesses. However, while determining the room price with the PSM method, the current services of the hotel business were taken into account in the study. In future studies, more general results can be obtained by repeating the research in different hotels and on a larger sample.

Price research was conducted during the peak season. In future studies, price comparison can be made according to the occupancy rates in different seasons. Also, their effectiveness can be measured using different price research methods simultaneously.

Price thresholds and perceptions change when customers get information about the product, or customer satisfaction and customer loyalty increases. In this context, price researches can be conducted according to customer profiles and awareness levels. Also, the effects of using the optimal price determined by the PSM method in dynamic pricing on revenue maximisation can be measured. Besides, by including the customer profitability analysis method in the price research process, the customer groups with the highest revenue and the most cost can be determined. Thus, the right customer decision can be more effective in terms of yield management.

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RESEARCH ARTICLE

Relationship Between Sustainability Report, Financial Performance, and Ownership Structure: Research on The Turkish Banking Sector

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Abstract

The financial statements of companies have been evaluated in financial performance analysis for many years. However, today, investors and business stakeholders, who want to invest in businesses, demand not only the information presented in financial statements, but also non-financial information to see future status and test whether it have a sustainable structure. In this context, the reporting of information on the economic, social, and environmental dimensions of businesses is possible through sustainability reporting. The purpose of this study is to reveal the sustainability scores of banks operating in the Turkish Banking sector. Another aim of the study is to determine the relationship between the sustainability score of banks, financial performance indicators, and ownership structure. In the study, the compliance scores of banks along with a sustainability report determined the framework of criteria for sustainability reports standardized by the GRI. From 2013-2018, the data of 10 banks that published sustainability reports in the Turkish Banking Sector were analysed. According to the results obtained from the research, the sustainability score of banks was not effective based on their financial performance. On the other hand, an increase in the shares of the largest shareholder capital caused a decrease in the sustainability scores of banks.

Keywords

GRI, Sustainability reporting, Financial performance, Ownership structure, Banking

Introduction

With the onset of the industrial revolution, radical changes occurred in production processes, and labour-based production was replaced by mechanization and technology. With this change, there was a huge increase in the amount of goods and services produced. The increase in production also caused an increase in the need for raw materials and natural resources. The fact that businesses, governments, and other segments of society needed more resources brought the concept of sustainability to the agenda. In the Bruntdland report of 1987, the concept of sustainability emphasized "meeting the needs of today's generations without compromising the ability of future generations to meet their own needs" and defined

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sustainable development. Investors wanted the companies in which they planned to invest to have a sustainable structure when making an investment decision, and thus, they wanted to evaluate not only the financial data but also non-financial data. It is not possible to report in the financial statements of businesses developments in a global economy effective all over the world, disease, or an environmental problem occurring in a country that causes production to stop in various parts of the world, threatens natural resources, and raw materials. Sustainability reports are a tool that provide an evaluation of economic, social, and environmental aspects in addition to the continuity of corporate performance about internal and external stakeholder groups (Düzer and Önce, 2017: 638). In 1997, John Elkington coined the concept of "Triple Bottom Line", which stated that corporate sustainability had three pillars: economic, environmental, and social. Thus, traditional accounting expanded to include social and environmental performance as well as financial performance (Gençoğlu and Aytaç, 2016: 52). As a result, greater emphasis was placed on problems caused by businesses that grew by consuming world resources since the industrial revolution, and in addition, how much money businesses earned, and how this money earned became an important criterion (Altınay, 2016: 50).

It is the Global Reporting Initiative (GRI) headquartered in the Netherlands, which standardizes sustainability reports that include financial and non-financial statements and that has gained importance due to an increase in the economic, social, and environmental crises. The GRI is an international organization that develops sustainable reporting principles, sustainability reporting guidelines, works for a sustainable economic structure and is one of the leading institutions in the field. The GRI principles were first published in 2000, and in May 2013, the fourth generation reporting principle G4 was published by the GRI and was implemented in 2015. Seventy-eight percent of the top 100 companies (N100) in every country who reports sustainability refers to GRI principles (Aras and Sarıoğlu, 2015). It is among the most important advantages of the GRI reporting framework to include the participation of multiple stakeholders and be accepted all over the world (Lozano and Huisingh, 2011: 101).

Sustainability reports developed within the scope of the GRI covers the results of businesses undertakings, strategies, and management practices.

Kolk (2008) listed the reasons for sustainability reporting as follows:

- An important tool to achieve specific goals.
- Facilitates the implementation of an environmental compliance strategy.
- Raises awareness of environmental problems in businesses.
- Provides opportunity for businesses to clearly convey their messages both inside and outside.
- Provides transparency which leads to an increase in the trust for a business.
- Fosters communication efforts and allows standardization in communication.
- Allows business to run a campaign.

- Increases business reputation, reduces costs, increases efficiency, increases employee motivation, and business development opportunities.

Lozano (2013) stated that there were two main reasons for the preparation of organizational sustainability reports. The first one was to evaluate the economic, environmental, and social dimensions of the organization, and the second one was to share the efforts and sustainability of the organization with its stakeholders.

The categories and elements included in the GRI G4 sustainability reporting guideline are presented in the table below.

Table 1
Categories and Elements Included in the Sustainability Reporting Guideline

Category	**Economic**	**Environmental**
Elements	**1.**Economic performance **2.**Market assets **3.**Indirect economic effects **4.**Purchasing practices	**1.**Materials **2.**Energy **3.**Water **4.**Biodiversity **5.**Emitions **6.**Wastewater and waste **7.**Goods and services **8.**Adaptation **9.**Transportation **10.**General **11.**Environmental evaluation of the supplier **12.**Environmental complaint mechanisms

Category	**Social**			
Sub-categories	**Labour Practices and Decent Work**	**Human Rights**	**Community**	**Product Responsibility**
Elements	**1.**Employment **2.**Labour Management Relationships **3.**Occupational Health and Security **4.**Education and Instruction **5.**Diversity and Equality of Opportunity **6.**Equal Wage for Women and Men **7.** Evaluation of the Supplier in terms of Labour Practices **8.**Complaint Mechanisms for Labour Practices	**1.**Investmnet **2.**Prevention of Discrimination **3.** Right to Organization and Collective Bargaining **4.**Child Workers **5.**Forced and Compulsory Labour **6.**Security Practices **7.** Rights of Local People **8.**Evaluation **9.**Evaluation of the Supplier in terms of Human Rights **10.**Human Rights Complaint Mechanisms	**1.**Local Communities **2.** Fighting Corruption **3.**Public Policy **4.**Anti-Competitive Behaviour **5.**Adaptation **6.**Evaluation of the Suppliers in terms of their Effects on the Community 7.Complaint Mechanisms for the Effects on the Community	**1.**Client Health and Safety **2.**Labelling of Products and Services **3.**Marketing Communication **4.**Client Privacy **5.**Adaptation

Sustainability reporting was started on a voluntary basis, but countries began to introduce voluntary or mandatory regulations over the past 15 years. Especially the 2008 global financial crisis caused tightening of financial regulations in developing countries. During this crisis, some countries made incentive regulations for sustainability reporting and some went even further and determined the minimum information that must be explained. Thus, in many countries, it has become mandatory to publish sustainability data on issues related to public procurement, being listed on the stock exchange, environment, occupational health, and safety. An example is the obligation to disclose non-financial information of publicly owned businesses in countries such as Sweden, India, and Russia. In addition, countries such as Finland, France, Spain, the Netherlands, Brazil, and China have made it compulsory for public enterprises to disclose their non-financial information as they operate on behalf of the community (KPMG, GRI and UNEP, 2013: 17). Within this framework, ownership structures are also becoming an important issue in sustainability reporting as well as stakeholders.

The purpose of the current study is to analyse the relationship between sustainability reporting, financial performance, and ownership structure in the banking sector in Turkey. Banks thatled economic development with their fund raising and funding activities. In this way, banks directly affect society, the environment and the economy with the quality and quantity of services they provide. Therefore, whether banks have a sustainable structure is important for all stakeholders. Many banks establishedinternal units to carry out environmental activities, publish sustainability reports, and develop environmentally friendly products and services. Some banks go beyond this and continue their activities for the purpose of sustainable development (Kaya, 2010: 76).

No study was found investigating the sustainability reporting, financial performance, and ownership structure of banks in Turkey. In the current study, the compliance score of banks along with a sustainability report determined the framework of the sustainability reports standardized by the GRI. When the existing national literature was analysed, there were some studies that compared the performance of companies that publish and do not publish sustainability reports or determined their sustainability level through content analysis. The current study is quite different from other studies both in terms of sector, variables, and method. The current study is expected to shed light on similar research to be conducted in other sectors. In this regard, the current study is believed to be incredibly important and will contribute to the literature.

In the following first section of the study, the concept of stakeholder, which is an important element in the Brundtland report, and the sustainability reporting activities carried out in the following phase, are discussed within the framework of stakeholder theory. In addition, explanations are made regarding the concept of the ownership structure within the framework of corporate governance. In the second section, the literature on the relationship between

financial performance and sustainability reporting in the banking sector in Turkey is presented. Next, the relationship between sustainability reporting and financial performance and ownership structure is analysed and finally results are presented and evaluations are made.

Stakeholder Theory

Stakeholders are generally defined as individuals or groups having certain interests in business. Neo-classical economics promotes the understanding that stakeholders are entitled to the profits of a business and that the business tries to maximize shareholders' revenues. In this framework, stakeholders have a privileged and prioritized position and legal rights to receive shares from the profit of the business. The shareholder theory advocated by neo-classical economics was criticized by Freeman in the Strategic Management: Stakeholder Theory (1984) and it has become one of the important management theories in recent years. Although stakeholder theory entered management literature in the 1970s, its fundamentals are based on Adam Smith's Economic theory. As Adam Smith put it in "The Theory of Moral Sentiments" in 1759 and in "The Wealth of Nations" in 1776, ethical and economic benefits are in a relationship of mutual utilitarianism and if businesses can provide these two benefits together, they should be considered to have worked effectively. These views of Smith in the field of ethics are expressed under the assumption that businesses are considered closed systems and are not affected by the environment. However, in the 1950s, with the Quality Movement, raising awareness of consumers and increasing lobbying activities as well as the demands for the protection of the environment have revealed the fact that businesses and society interact with each other. Thus, it has become accepted that businesses are open systems, and influenced by external environmental dynamics. With the acceptance of the fact that businesses are open systems, Corporate Social Responsibility discussions have become part of the literature. This approach found support in a short time, forming the foundations of many theories such as Shareholder Theory and Stakeholder Theory (Ertuğrul, 2008: 200).

The first study in which stakeholder theory was discussed in detail is the book of Strategic Management: A Stakeholder Approach by R. Edward Freeman in 1984. Freeman defined the concept of stakeholder as groups that are vital for the continuation of the organization, have a dominant importance for the survival and success of the organization, and are effective in business activities. According to Freeman, the stronger the bonds that are established between groups that have interests in the business, the easier it will be to achieve common goals; otherwise, the weakening of relations between groups will make it difficult to achieve those goals. This approach is the basic premise of stakeholder theory (Aktan and Börü, 2007: 14). According to Freeman's (1984) stakeholder theory, stakeholders are divided into two groups: as internal and external stakeholders. Internal stakeholders include founders, shareholders, managers, and employees. External stakeholders include community, government,

customers, suppliers etc. Stakeholder theory aimed to strike a balance between internal and external stakeholders. According to Freeman's (1984) stakeholder theory, it was not enough for businesses to have corporate governance mechanisms that only considered the relations between managers and shareholders. In addition, in order for the business to maintain a sustainable structure, other groups related to the business should also be taken into consideration (Koçel, 2003). Emshoff and Freeman argued that the theory has two basic principles. The first principle was "determining what the purpose of the business is" and the determination of the purpose ensured the development of the business and improvement in performance. The other principle of the theory was "determining what the responsibilities are towards stakeholders". According to this principle, the management should regulate its relations with its stakeholders in order to achieve its managerial goals (Ertuğrul, 2008: 201).

The stakeholder theory that Freeman put forward in 1984 included a traditional approach. As of 2000, it has been generally accepted that the concept of stakeholders has a more general nature and not only consists of lenders, employees, customers, and suppliers, but also includes the state, local communities, environmentalists, media, and future generations as part of society (Wenzhong ve Limin, 2012: 59-61). In this framework, stakeholders are closely related to the development and sustainability of business, and operational risks, costs, decision-making processes, and the quality of business activities are related to stakeholders. This cycle requires the concepts of sustainability and corporate social responsibility be handled within the framework of the stakeholder approach.

Literature

There were many studies examining the relationship between sustainability reporting and financial performance. While these studies investigated the relationship between the two variables, they used very different methods and found different results even in similar sectors. Some of these studies performed content analysis with annual reports, some with sustainability index data. In addition, accounting-based indicators such as rate of return on assets or rate of return on equity as well as market-based indicators such as profit per share or price/earnings ratio were also used. Studies

carried out for different industries in different countries and from different time periods. Therefore, different results were obtained from these studies examining the relationship between sustainability reporting and financial performance. Some of these studies found a positive relationship between sustainability reporting and financial performance, others found a negative relationship, while still others found no relationship at all (Vance, 1975; Preston and Q'Bannon, 1997; Ameer and Othman, 2012; Iqbal et al., 2012, D'arcimoles and Trebucq, 2002; Becchetti et al., 2008). In studies where a negative relationship was found between sustainability practices and financial performance, the main idea was that sustainability studies

were costly and had a decreasing effect on operating profit. However, the new classification developed within the study conducted by Roman et al. (1999) led to a decrease in the number of studies showing negative correlation and thus determined that a significant part of the studies examined in this framework found a positive relationship.

Within sustainability reporting, studies investigating the relationship between ownership structure and financial performance have become important in recent years. Although volunteering is essential in sustainability reporting, the binding of sustainability reporting to global standards with GRI principles and their implementation among businesses led businesses to start reporting non-financial information besides their financial statements in accordance with the legislation (King and Bartels, 2016). Sweden was the first country to ask public organizations to submit corporate social responsibility reports according to GRI standards in 2007 (Angelstig and Gustavsson, 2016: 6). While some studies examined the relationship between ownership structure and sustainability reporting, more places were allocated to social and environmental information in the reporting of public organizations (Cormier & Gordon, 2001; Tagesson, Blank, Borger & Collin, 2009), while in some other studies, the exact opposite was observed (Balal, 2000; Secci, 2005). In line with these developments, the relationship of ownership structure with sustainability reports based on stakeholder demand has attracted the attention of academics (Kane and Velury 2004, Glac 2010, Del Guercio and Tran 2012).

Pava and Krausz (1996) investigated the relationship between corporate social responsibility and financial performance. In their study, data was obtained for the periods of 1985-1987 and 1989-1991 from a total of 106 businesses. These 106 businesses were divided into two equal groups depending on the importance they attached to social responsibility statements. Thus, one group consisted of 53 businesses attaching greater importance while the other group consisted of 53 businesses attaching less importance to social responsibility statements. According to the results obtained from the study, the market based performance indicators of the group attaching greater importance to social responsibility were slightly higher than the other group. No significant difference was found between the price/earnings ratios of the two groups. The market value/book value ratio return on assets, equity, and profits per share of the group of businesses attaching greater importance to social responsibility were higher than the other group.

Ghazali (2007) investigated the effect of ownership structure on corporate social responsibility disclosures. In the study, social responsibility statements were obtained from the annual reports of large businesses operating in the Malaysian stock exchange and the data was analysed by a multiple regression method. According to the results of the study, the businesses owned by managers made a lower level of social responsibility disclosure than public enterprises.

Fauzi and İdris (2009) investigated the relationship between corporate social responsibility and financial performance within the framework of public and private enterprises. Ac-

cording to the results of the study, there was a positive relationship between corporate social responsibility and financial performance under the assumption of resource theory and good management theory.

Burhan and Rahmanti (2012) analysed the relationship between sustainability reporting and financial performance for all dimensions. In the study, the data of 32 businesses operating in Indonesia Stock Exchange for the period of 2006-2009 was analysed. Sustainability reporting within the framework of the GRI G4 sustainability guideline and the three-dimensional independent variable rate of return on assets dependent variables were used as an indicator of financial performance. According to the research results, only the social dimension of sustainability reporting affected financial performance.

Ameer and Othman (2012) investigated the relationship between sustainability reporting and financial performance. In the study, the data of 100 big sustainable companies from developed and developing countries for the period of 2006-2010 was examined. In addition, 100 companies of the same size were included in the analysis as the control group. In the study, sales/income growth, return on assets, profit before tax and cash flow indicators were used as financial performance indicators. According to the results of the study, the businesses that attach greater importance to sustainability practices performed better in terms of return on assets, profit before tax, and cash flow indicators.

Darus et al. (2013) stated that family ownership and foreign ownership were important factors in informing the shareholders through the use of the corporate website in their research on the Malaysian Stock Exchange.

Başar (2014) investigated the reporting levels of companies in the BIST Chemistry, Petroleum, and Plastic Indexes between 2010 and 2012 according to the social responsibility criteria set by GRI and the relationship of the results with the financial performance criteria. The financial performance criterion of the study was profit per share, and correlation analysis was used as a method. According to the results of the study, there was an inverse relationship between social responsibility disclosures and profit per share.

Fettahoğlu (2014) investigated whether there was a relationship between the social responsibilities of businesses and their financial performance. In the study, 16 companies whose stocks were traded in İMKB and which published sustainability reports between 2009 and 2011 were identified. Social responsibility components were analysed under four headings: relations with employees, relations with the environment, relations with the community, and product responsibility. The financial indicators that made up the dependent variables of the study were return on equity, return on assets, leverage ratio, asset turnover rate, profit per share, and return on stock. Multiple regression analysis was used as the method. According to the results of the study, there was a negative relationship between leverage ratio and culture

and art expenditures. A positive relationship was determined between the ratio of collective bargaining staff, the increase in the number of women, the increase in environmental expenditures, the increase in label information and leverage ratio. A reverse relationship was determined between the asset turnover rate and the ratio of young employees, and a positive relationship was found between other social responsibility components. In the study, a negative relationship was determined between profit per share and culture and art expenditures. Accordingly, the per-share profit of businesses that support culture and arts was lower than that of those that did not support culture and arts.

Özçelik et al. (2014) investigated the relationship between corporate social responsibility and financial performance by analysing the 2010-2012 data of companies in the BIST 100 index. In the study, the hypothesis that companies publishing corporate social responsibility reports had higher performance in terms of financial accounting was tested with logistic regression analysis. In the study, corporate social responsibility was used as the dependent variable while financial performance rates, firm size, risk, and partnership structure were used as the independent variables. According to the results of the study, a significant relationship was found between company size and corporate social responsibility. No relationship was found between financial performance, risk and partnership structure and corporate social responsibility.

Shamil et al. (2014) investigated the effect of the board structure on sustainability reporting. In the study, data was collected from the 2012 annual reports of 148 businesses selected randomly from the Colombo Stock Exchange (Sri Lanka) and sequential logistic regression analysis was performed. According to the results of the study, while there was a positive relationship between executive duality and sustainability, there was a negative relationship between women management and sustainability reporting.

De Beelde and Tuybens (2015) examined the relationship between the largest shareholder and sustainability reporting within the scope of ownership density. According to the results of the study, the density of ownership was higher in companies that did sustainability reporting compared to companies that did not perform sustainability reporting.

Arayssi et al. (2016) investigated the impact of gender differences in company boards on sustainability reports and shareholder well-being. According to the results of the study, the presence of women in company boards decreased the risk of the company and increased financial performance.

Şişman, Doğan and Ağca (2016) analysed the corporate social responsibility or sustainability reports of 50 businesses listed on the BIST (İstanbul Stock Exchange) and included in the sustainability index to determine the impact of their 2013 supply chain activities on their financial performance of 2014. According to the results of the study, there was a significant

and positive relationship between economical supply chain management activities and return on assets and return on equity, but there was no significant relationship between environmental and social supply chain management activities and return on assets and return on equity.

Angelstig and Gustavsson (2016) used the logistic regression method for companies operating in NASDAQ Stockholm at the end of 2013 to determine the factors affecting their preference for publishing sustainability reporting. In the study, it was analysed whether the ownership structure had an impact on sustainability reporting based on the corporate investor and large shareholder ownership. In the study, a positive relationship was determined between sustainability reporting and corporate investor ownership. Accordingly, the increase in corporate investor ownership increased the likelihood of sustainability reporting. No statistically significant relationship was found between the intense ownership structure and the decision on sustainability reporting practices. The effect of investor identity on sustainability reporting decisions was also investigated in this study. A positive relationship was determined between private corporate investor ownership and decision making, and a negative relationship between public corporate investor ownership and decision making.

Haladu and Salim (2016) examined the relationship between environmental information disclosures and ownership structure within the framework of GRI G4 principles. In the study, the data of 67 companies for the period of 2009-2014 was analysed. According to the results of the study, there was a statistically significant and strong relationship between the company's environmental disclosures and ownership structure. Firms with foreign ownership structure in countries called third world countries such as Nigeria were more sensitive to environmental issues than firms with local ownership structure.

Kasbun, Teh and Ong (2016) investigated the relationship between sustainability reporting and financial performance. In their study, they analysed the data of 200 companies that traded on the Malaysian Stock Exchange. Return on assets and return on equity were the financial performance indicators used in the study. According to the results of the study, sustainability reporting positively affected the financial performance of businesses.

Nobanee and Ellili (2016) investigated the level of corporate sustainability disclosures of banks operating in the United Arab Emirates stock exchange for the period of 2003-2013. In the study, it was determined that corporate sustainability disclosures were low in the framework of sustainability reporting of the banks operating in the UAE stock exchange. It was concluded that the conventional sustainability statements of conventional banks were higher than those of Islamic banks. In addition, while sustainability disclosures were found to affect the financial performance of conventional banks significantly and positively, no statistically significant effect of sustainability disclosures on the financial performance of Islamic banks was determined.

Smit and Zyl (2016) analysed the annual integrated reports of eight commercial banks operating in the Johannesburg Stock Exchange with content analysis and found that the compliance of social reporting with GRI G4 standards was very weak.

Aman and İsmail (2017) examined the factors affecting the sustainability report statements of the firms listed on the Malaysian Stock Exchange in 2016. According to the results of the study, sustainability reports were affected by the ownership structure (family ownership, holding ownership and board of directors). According to the results, there was a statistically significant relationship between the type of industry and the level of sustainability reporting.

Akyüz and Yeşil (2017) analysed the 2011-2015 data of 19 businesses operating in the production sector registered in the BIST Sustainability Index and examined their financial performance. According to the results of the study, the financial performance of the companies that meet the sustainability criteria were also positively affected while meeting these criteria.

Düzer and Ago (2017) examined whether the financial performance of companies that published and did not publish a sustainability report differs. To this end, 30 companies that published sustainability reports according to GRI reporting standards were selected among the companies operating in BIST for the period of 2008-2014. In addition, a control group consisting of 26 companies, which were in the same sector with these companies and which did not publish a sustainability report, was created. Two independent samples t-test and Mann Whitney U test were used to determine whether there were any financial performance differences between the companies. According to the results of the study, the return on assets and return on equity were higher among the companies that published sustainability reports. In addition, it was concluded that the companies that published sustainability reports had lower price/earnings ratio indicators. No significant difference was found between the market value/book value ratios of companies that published and those that did not publish sustainability reports.

Rudyanto (2017) investigated the impact of public ownership, family ownership, and managerial effectiveness on the quality of sustainability reports. In the study, the 2010-2014 data of 123 companies operating in the Indonesian Stock Exchange were analysed. According to the results of the study, public ownership, independence, and authority of the board of directors positively affect the quality of sustainability reports. Family ownership and the size of the board of directors had no influence on the quality of sustainability reports.

Şendurur and Karacaer (2017) determined triple responsibility reporting scores based on the sustainability reports of the companies traded in the BIST 100 index within the framework of the triple responsibility reporting proposed by Elkington (1997) and investigated the relationship between the 10 variables determined by multiple regression analysis. The 10 in-

dependent variables used in the study are sector, size, country of origin, ownership structure, auditor type, business type, leverage ratio, liquidity, profitability, and age. In the ownership structure analysis, the enterprises were divided into two as public and private enterprises. The profitability variable in the study was the period net profit. According to the results of the study, no relation was found between the triple responsibility reporting scores and the ownership structure. In addition, a medium positive correlation was found between triple responsibility reporting scores and leverage ratio and profitability.

Taşdemir (2017) investigated whether corporate social responsibility disclosures of businesses had an impact on their financial performance within the scope of sustainability reports. In the study, information given by 35 companies in the BIST Sustainability Index regarding their corporate social responsibility in their sustainability reports and annual reports between 2011 and 2016 was determined. Financial performance indicators of the study were activity rates, profitability ratios, liquidity ratios, and financial structure ratios. According to the results of the study, there was a significant and positive relationship between the corporate social responsibility statements of the enterprises and the profitability ratios and liquidity ratios.

Şendurur and Temelli (2018) determined the sustainability scores of traditional banks and participation banks and analysed the relationship between these scores in relation to size, country of origin, auditor type, leverage ratio, liquidity, profitability, and age, which were the independent variables of the study. The sustainability score was the dependent variable of the study. In the study, the country of origin and ownership structure were used as dummy variables. The sustainability scores were divided into two as social and environmental scores. According to the results of the research, there was no significant difference between the participation banks and traditional banks in terms of social activities, and the traditional banks scored well above the participation banks in terms of environmental activities. In addition, due to the small size of the sample, a significant relationship could not be detected as a result of the t-test conducted between the sustainability scores and dummy variables.

Mita et al. (2018) investigated the level of corporate social responsibility disclosures in the banking sector in five Asian countries - Indonesia, Philippines, Malaysia, Singapore, Thailand. In the study, it was determined that the banks' compliance levels to GRI G4 principles are exceptionally low. In addition, it was stated that corporate social responsibility disclosures were positively associated with financial performance.

Laskar (2018) investigated the impact of corporate sustainability reporting on firm performance in four Asian countries - Japan, South Korea, Indonesia, and India. In the study, the data of 36 non-financial firms from Japan, 28 from India, 26 from South Korea and 21 from Indonesia for the period of 2009-2014 were analysed. According to the results of the study, the sustainability statements of Japanese enterprises were higher at the rate of 90%, followed by India with 88%, South Korea with 85% and Indonesia with 72%. According to the results

of the regression analysis, there was a statistically significant and positive relationship between sustainability reporting and financial performance. According to another result obtained, the impact of sustainability reports on firm performance was higher in developed countries than in developing countries.

Topaloğlu (2019) examined the relationship between sustainability studies and financial performance. In the study, the financial performances of 11 companies included in the BIST Sustainability Index and 27 companies not included in the index were analysed. The companies included in the index were included in the analysis as "1" and those not included in the index as "0". The data of 2014-2018 period were used in the study and panel data analysis was used as the method. According to the results of the study, there was a significant and positive relationship between sustainability studies and the rate of active profitability.

Buallay (2019) investigated the relationship between sustainability reporting and the rate of return on assets, rate of return on equity and Tobin's Q rate. In the study, the data of 235 banks for the period of 2007-2016 were analysed. It was found that environmental, social, and corporate governance statements had a positive effect on performance. However, when the research results were examined individually, different results emerged. Accordingly, environmental disclosures affected active profitability and return on equity positively, whereas corporate governance disclosures affected active profitability and return on equity negatively, and Tobin's Q rate positively.

Buallay (2019) conducted a comparative study between the banking and manufacturing sectors, investigating the impact of sustainability reporting on financial performance and market performance. In the study, the data of 932 manufacturing companies and 530 banks from 80 countries for the period of 2008-2017 were analysed. According to the results of the study, sustainability reports within the framework of environmental, social, and corporate governance statements had a positive effect on the financial performance and market performance of the manufacturing sector, while it had a negative effect on the banking sector.

Methodology

Purpose of the Study

The purpose of the current study is to reveal the sustainability scores of the banks operating in the Turkish Banking sector. Another purpose of the study is to determine the relationship between the sustainability score of the banks and financial performance indicators. In the study, interactions between sustainability scores will also be determined according to the ownership structure of banks (foreign, corporate, biggest ownership, biggest three ownership,

free float ratio). In this study, the compliance score of the banks with the sustainability report was determined within the framework of the criteria of sustainability reports standardized by the GRI.

Data Set and Sample

In the study, data of 10 public, private, and foreign banks operating in the Turkish Banking sector for the period of 2013-2018 were used (Türkiye Halk Bank A.Ş., Akbank, Türkiye İş Bank A.Ş., Şekerbank T.A.Ş, Türkiye Sınai Kalkınma Bank A.Ş., Türk Ekonomi Bank, Garanti Bank, Türkiye Vakıflar Bank A.O., Yapı ve Kredi Bank A.Ş., T.C. Ziraat Bank A.Ş.). Financial data used in the empirical analysis were obtained from the web page of the Banks Association of Turkey (www.tbb.org.t). Sustainability scores were created on the basis of the Sustainability Reports published on the banks' websites.

Variables

In the current study, accounting based indicators were used as financial performance indicators. Two financial performance indicators were used in the study. These were return on equity (ROE) and return on assets (ROA).

Return on Assets (ROA): Calculated by proportioning the net profit of the period to total assets.

Return on Equity (ROE): Calculated by proportioning the net profit of the period to the total equity.

In the study, 5 variables were used as ownership structure indicators. These are given below;

LARGEST1: Obtained by dividing the capital share of the partner with the largest share by total capital.

LARGEST3: Calculated by proportioning the capital share of the third largest shareholder to total capital.

FOREIGN: Obtained by dividing the amount of capital held by foreign investors by total capital.

INSTITUTIONAL: Obtained by dividing the amount of capital held by institutional investors by total capital.

FREE FLOAT RATIO: Flee Float Rate of Companies.

Three variables related to sustainability score were used in the study. Sustainability levels of the banks were divided into three categories: Economic Sustainability, Environmental Sustainability, and Social Sustainability. The sustainability levels of the banks were determined by 40 criteria so that the sustainability scores of the banks were calculated. These 40 criteria are given in the appendices. A total of 2400 data were produced in the study.[1]

In the study, economic, environmental, and social sustainability data were searched with 0-1 values by analysing the sustainability reports of the banks. In this way, economic, environmental, and social sustainability scores were created. If a bank has economic, environmental, and social sustainability activities, that activity is given a value of 1, in other cases a value of 0 is given. G4 Sustainability Reporting Guidelines were taken as the basis for defining sustainability areas in the process of reviewing reports.

*ECONOMIC: (Total Score /13)*100*

*ENVIRONMENTAL:(Total Score /12)*100*

*SOCIAL: (Total Score /15)*100*

Table 2
Banks' Economic Sustainability Scores

BANKS	2013	2014	2015	2016	2017	2018
Akbank	7692	84.62	69.23	76.92	76.92	**100.00**
Garanti Bank	**100.00**	76.92	76.92	**100.00**	76.92	84,.62
İş Bank	69.23	76.92	84.62	76.92	**100.00**	76.92
Şekerbank	76.92	**100.00**	76.92	84.62	69,23	76.92
Halk Bank	84.62	76.92	**100.00**	76.92	76.92	84.62
TSKB	76.92	84.62	69.23	76.92	61.54	0.00
Vakıfbank	**100.00**	76.92	76.92	84.62	76.92	84.62
Yapı Kredi Bank	69.23	76.92	61.54	0.00	**100.00**	76.92
TEB	76.92	38.46	76.92	84.62	69.23	76.92
Ziraat Bank	84.62	0,00	**100.00**	76.92	69.23	38.46

Economic sustainability scores of the banks are given in Table 2. When the results were analysed, the banks with the highest economic sustainability scores between 2016 and 2018 are Akbank, İşbank, Yapı Kredi and Garanti. Between 2013 and 2015, public banks had the highest economic sustainability scores.

1 10 Bans*6 Years*40 Criteria = 2400

Table 3
Banks' Environmental Sustainability Scores

BANKS	2013	2014	2015	2016	2017	2018
Akbank	66.67	66.67	83.33	66.67	83.33	**91.67**
Garanti Bank	**100.00**	66.67	75.00	75.00	75.00	66.67
İş Bank	83.33	66.67	83.33	**83.33**	**100.00**	66.67
Şekerbank	75.00	75.00	75.00	66.67	83.33	66.67
Halk Bank	83.33	**83.33**	**100.00**	66.67	75.00	58.33
TSKB	75.00	66.67	83.33	66.67	66.67	16.67
Vakıfbank	**100.00**	66.67	75.00	58.33	66.67	66.67
Yapı Kredi Bank	83.33	66.67	66.67	16.67	**100.00**	66.67
TEB	75.00	58.33	66.67	75.00	83.33	66.67
Ziraat Bank	66.67	16.67	**100.00**	66.67	66.67	58.33

Environmental sustainability scores of the banks are given in Table 3. When the results were analysed, the banks with the highest environmental sustainability scores between 2016 and 2018 were Akbank, İşbank and Yapı Kredi. Between 2013 and 2015, public banks had the highest environmental sustainability scores.

Table 4
Banks' Social Sustainability Scores

BANKS	2013	2014	2015	2016	2017	2018
Akbank	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Garanti Bank	**100.00**	73.33	86.67	93.33	**100.00**	**100.00**
İş Bank	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	73.33
Şekerbank	86.67	93.33	**100.00**	**100.00**	**100.00**	**100.00**
Halk Bank	**100.00**	**100.00**	**100.00**	73.33	93.33	66.67
TSKB	**100.00**	**100.00**	**100.00**	**100.00**	93.33	0.00
Vakıfbank	**100.00**	73.33	93.33	66.67	86.67	**100.00**
Yapı Kredi Bank	**100.00**	**100.00**	**100.00**	0.00	**100.00**	73.33
TEB	93.33	53.33	86.67	**100.00**	**100.00**	**100.00**
Ziraat Bank	93.33	0.00	**100.00**	73.33	93.33	53.33

Social sustainability scores of the banks are given in Table 4. When the results were analysed, the banks with the highest social sustainability scores were Akbank, TEB and İşbank. Public banks, on the other hand, had a relatively lower social sustainability score than other banks.

Table 5
Banks' Total Sustainability Scores

BANKS	2013	2014	2015	2016	2017	2018
Akbank	82.50 (4)	85.00 (3)	85.00 (3)	82.50 (4)	87.50 (2)	**97.50 (1)**
Garanti Bank	**100.00 (1)**	72.50 (5)	80.00 (4)	**90.00 (1)**	85.00 (3)	85.00 (2)
İş Bank	85.00 (3)	82.50 (4)	90.00 (2)	87.50 (2)	**100.00 (1)**	72.50 (4)
Şekerbank	80.00 (5)	**90.00 (1)**	85.00 (3)	85.00 (3)	85.00 (3)	82.50 (3)
Halk Bank	90.00 (2)	87.50 (2)	**100.00 (1)**	72.50 (5)	82.50 (4)	70.00 (5)
TSKB	85.00 (3)	85.00 (3)	85.00 (3)	82.50 (4)	75.00 (6)	5.00 (7)
Vakıfbank	100.00 (1)	72.50 (5)	82.50 (4)	70.00 (6)	77.50 (5)	85.00 (2)
Yapı Kredi Bank	85.00 (3)	82.50 (4)	77.50 (5)	5.00 (7)	**100.00 (1)**	72.50 (4)
TEB	82.50 (4)	50.00 (6)	77.50 (5)	87.50 (2)	85.00 (3)	82.50 (3)
Ziraat Bank	82.50 (4)	5.00 (7)	**100.00 (1)**	72.50 (5)	77.50 (5)	50.00 (6)

Total sustainability scores of the banks are given in Table 5. When the results were analysed, the banks with the highest total sustainability scores in 2018-2017-2016 were Akbank, İşbank and Yapı Kredi, and Garanti, respectively. The banks with the highest sustainability scores in 2015-2014-2013 were Garanti Bank, İşbank, Şekerbank and Ziraat bank, respectively.

Table 6
Banks' Sustainability Means Scores Between 2013 And 2018.

BANKS	Economic Sustainability	Environmental Sustainability	Social Sustainability	Total Sustainability	Total Rank
Akbank	80.7683 (3)	76.3900 (3)	**100.0000 (1)**	**86.6667**	1
İş Bank	80.7683 (3)	**80.5550 (1)**	95.5550 (3)	86.2500	2
Garanti Bank	**85.8967 (1)**	76.3900 (3)	92.2217 (4)	85.4167	3
Şekerbank	80.7683 (3)	73.6117 (4)	96.6667 (2)	84.5833	4
Halk Bank	83.3333 (2)	77.7767 (2)	88.8883 (5)	83.7500	5
Vakıfbank	83.3333 (2)	72.2233 (5)	86.6667 (6)	81.2500	6
TEB	70.5117 (4)	70.8333 (6)	88.8883 (5)	77.5000	7
YKB	64.1017 (5)	66.6683 (7)	78.8883 (8)	70.4167	8
TSKB	**61.5383 (6)**	**62.5017 (8)**	82.2217 (7)	69.5833	9
Ziraat Bank	**61.5383 (6)**	**62.5017 (8)**	**68.8867 (9)**	**64.5833**	**10**

Table 6 shows the mean sustainability scores of the banks between 2013 and 2018. The bank with the highest mean economic sustainability score was Garanti Bank while the banks with the lowest mean economic sustainability scores were TSKB and Ziraat Bank. The bank having the highest mean environmental sustainability score was İş Bank while the bank having the lowest mean environmental sustainability scores were TSKB and Ziraat Bank. On the other hand, the bank having the highest mean social sustainability score was Akbank while the bank having the lowest mean social sustainability score was Ziraat Bank. When the banks were ranked in terms of total sustainability score, the bank with the highest score was Akbank while the bank with the lowest score was Ziraat Bank.

Table 7
Comparison of the Sustainability Scores of the Banking Sector by Years

Type of Transparency	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**TOTAL**
Economic Sustainability Level	81.5380 (2)	69.2300 (2)	79.2300 (3)	73.8460 (2)	77.6910 (3)	70.0000 (2)	75.2558 (2)
Environmental Sustainability Level	80.8330 (3)	63.3350 (3)	80.8330 (2)	64.1680 (3)	80.0000 (2)	62.5020 (3)	71.9452 (3)
Social Sustainability Level	97.3330 (1)	79.3320 (1)	96.6670 (1)	80.6660 (1)	96.6660 (1)	76.6660 (1)	**87.8883 (1)**
Total Sustainability Level	87.2500	71.2500	86.2500	73.5000	85.5000	70.2500	79.0000

In Table 7, the sustainability scores of the banking sector were compared by years. When the results were examined, the *Social Sustainability* was the highest among the sustainability dimensions of the banking sector while the lowest one was the *Environmental Sustainability*.

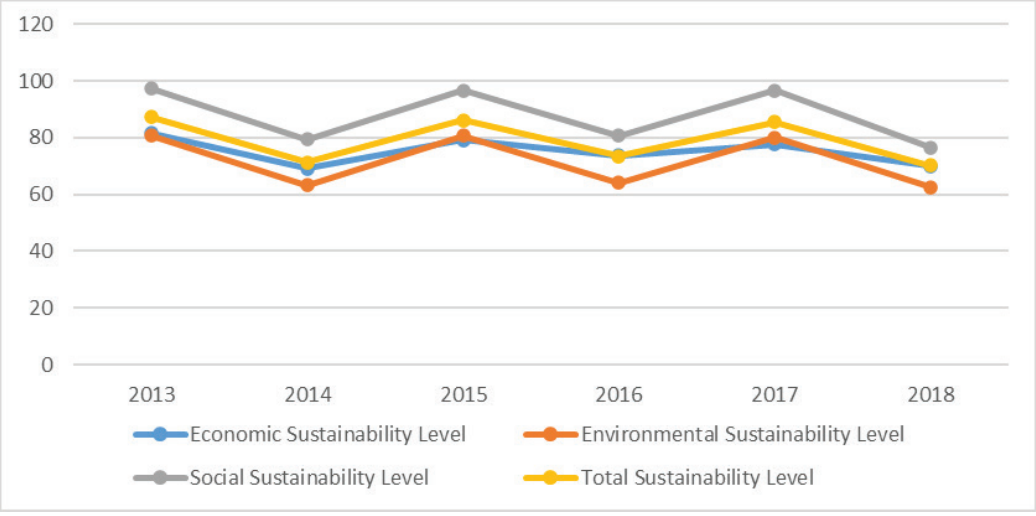

Figure 1. Sustainability scores of the banking sector by years

Figure 1 shows the sustainability scores of the banking sector by years. Every year, the social sustainability score of the banking sector is higher than the environmental and economic sustainability score. While the environmental sustainability and economic sustainability scores were remarkably close to each other in 2013, 2015 and 2017, in other years, the economic sustainability scores were partially higher than the environmental sustainability scores. The social, environmental, and economic sustainability scores of the banking sector are in a fluctuating trend.

Table 8
The Relationship Between the Banks' Sustainability Scores and Financial Performance and Ownership Structure

	ECONOMIC SUSTAINABILITY	ENVIRONMENTAL SUSTAINABILITY	SOCIAL SUSTAINABILITY
ROA	-.102	-.074	-.040
ROE	-.053	-.041	-.081
LARGEST1	-.332**	-.265*	-.333**
LARGEST3	-.235	-.218	-.278*
FOREIGN	.099	.036	.130
INSTITUTIONAL	-.220	-.161	-.096
FREEFLOATRATIO	.265*	.203	.232

In Table 8, the relationship between the banks' economic, environmental, and social sustainability scores and financial performances and ownership structures was tested with correlation analysis. When the analysis results are analysed, it is understood that there is no significant relationship between banks' economic, environmental, and social sustainability scores and ROA and ROE, which are financial performance indicators ($p>0.05$). However, there is a positive and significant relationship between the banks' economic sustainability score and free float ratio (FFR) ($p<0.05$). Similarly, although there is a positive relationship between the banks' environmental and social sustainability scores and free float ratio, the relationship is weak ($r=0.203$ and 0.232). There is no significant relationship between foreign investor ownership and institutional investor ownership and the economic, environmental, and social sustainability scores of the banks ($p>0.05$). However, there is a negative and significant relationship between the largest investor ownership and the three largest investors ownership and the economic, environmental, and social sustainability scores of the banks ($p<0.05$). In other words, as the largest investor ownership of the banks and the three largest investors ownership increase, the sustainability scores also increase.

Table 9
The Effect of the Banks' Sustainability Score on Financial Performance

Independent Variables	Dependent Variable: ROA			Dependent Variable: ROE		
	Beta	Std. Error	Significance	Beta	Std. Error	Significance
Constant	1.606	.360	.000	14.481	2.128	.000
Economic	-.006	.008	.446	.002	.046	.957
Environmental	-.001	.010	.884	.016	.056	.775
Social	.004	.007	.549	-.024	.041	.561
Significance of the Model	0.915			0.919		
The Number of Observations	60			60		

In Table 9, the effect of the banks' sustainability score on financial performance was tested with multiple regression analysis. When the analysis results are examined, it is seen that the economic, environmental, and social sustainability scores of the banks do not have any effect on financial performance ($p>0.05$). In other words, whether the banks' sustainability score is high or low does not cause any change in their financial performance.

Table 10
The Effect of the Banks' Sustainability Score on Financial Performance

Independent Variables	Dependent Variable Economic		Dependent Variable Environmental		Dependent Variable Social	
	Beta	Significance	Beta	Significance	Beta	Significance
Constant	93.453	.000	.000	14.481	108.151	.000
The Largest Ownership	-.343	.009	.446	.002	-.382	**.009**
Significance of the Model	**0.009**		**0.041**		**0.009**	
R^2	%9.5		%5.4		%9.6	
The Number of Observations	60		60		60	

In Table 10, the effect of the ownership structure of the banks on their sustainability score was tested with stepwise regression analysis. When the results of the analysis are examined, it is seen that the largest ownership structure of the banks is effective on their economic, environmental, and social sustainability scores ($p<0.05$). In other words, as the largest investor ownership of banks increases, the economic, environmental, and social sustainability scores also decrease. The rate of the change explained by the largest ownership structure in the economic, environmental, and social sustainability scores of the banks is 9.5%, 5.4% and 9.6%, respectively. However, as the other variables of ownership structure (the three largest investors ownership, institutional investor ownership, foreign investor ownership and free float ratio) were not significant, they were excluded from the stepwise regression model ($p> 0.05$).

Results

Sustainability reporting has become an important element in the interaction of businesses with their stakeholders. Through their sustainability reporting, businesses account for the management structure of the business, business strategy and the vision they put forward for the future to their stakeholders. The number of businesses publishing sustainability reports in the world has been increasing day by day, and the issue of sustainability has become more and more subject to research in academic circles. Sustainability reporting is an important tool for investors' future investment plans in terms of not only showing the financial performance of the business but also the impact it creates for the society and the environment.

In the current study, the sustainability scores of the banks operating in the Turkish Banking sector were determined. In the study, the relationship between the sustainability scores of banks and financial performance indicators was also determined. In addition, the interactions between sustainability scores according to the ownership structure of the banks have been another subject examined. The data of 10 public, private and foreign banks operating in the Turkish Banking sector for the period of 2013-2018 were used in the study.

According to the results of the content analysis related to sustainability scores, the highest economic sustainability score belongs to Garanti Bank, the highest environmental sustainability score belongs to İşbank and the highest social sustainability score and total sustainability score belong to Akbank. The lowest total sustainability score and the sustainability scores taken from the sub-dimensions belong to Ziraat Bank. Moreover, from among the sustainability dimensions addressed in the banking sector, "Social Sustainability" was found to be the highest while "Environmental Sustainability" was found to be the lowest.

In the study, it was also determined that the economic, environmental, and social sustainability scores of the banks are not effective on their financial performance. In other words, whether the banks' sustainability score is high or low does not cause any change in their financial performance. These findings concur with the findings reported by D'arcimoles and Trebucq (2002), Murray et al. (2006); Arsoy et al. (2012), Aggarwal (2013), Kusuma and Koesrindartoto (2014).

Another finding obtained in the current study is that the largest shareholder ownership in the total capital of the banks has an impact on the economic, environmental, and social sustainability scores. In other words, as the share of the largest shareholder of the bank's increases, the economic, environmental, and social sustainability scores also decrease. These findings are parallel to the findings of De Beelde and Tuybens (2015).

As a result, different and complex results were obtained from the studies investigating the relationship between sustainability reporting and financial performance. The results we obta-

ined in our study cover the 2013-2018 period of the banks operating in Turkey and publishing sustainability reports. In addition, analysis of the relationship between sustainability reports and ownership structure are important in terms of providing information regarding the quality and level of reports in different types of ownership structures.

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APP-1

CATEGORIES AND ELEMENTS USED IN THE STUDY ACCORDING TO GRI 4 PRINCIPLES		
Economic Sustainability	**Environmental Sustainability**	**Social Sustainability**
Incomes	Materials	Employment
Operating expenses	Energy	Occupational health and safety
Wages and profits	Water	Education and instruction
Social investments	Bio-diversity	Diversity and equality of opportunity
Assets at hand	Waste water and wastes	Labour practices complain mechanisms
Risks and opportunities arising from climate change	Goods and services	Investment
Compensation plan liabilities	Adaptation	Prevention of discrimination
Financial support received from the state	Transportation	Human rights complain mechanisms
Starting wage by gender	General	Local peoples
Senior management information	Evaluation of the supplier in terms of the environment	Public policy
Growth and effects on infrastructure investments	Environmental complaint mechanisms	Anti-competitive behavior
Economic effects of the business		Complaint mechanisms about the effects on community
Percentage of purchasing budget from local suppliers		Client health and security
		Marketing communication
		Client privacy

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RESEARCH ARTICLE

Relationship between Innovation Management and Innovative Organizational Culture in Logistics Companies: A Study in the City of Mersin*

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Abstract
Innovation management is essential for the growth and success of an organization. Innovation management is a precursor to the establishment of an innovative organizational culture. By encouraging staff to engage in innovative behavior, innovation management facilitates the creation and establishment of a culture of innovation in an organization. An organization can only change its cultural attitude and behavior by investing in innovation management practices—i.e., by applying innovation to the organization's strategies, systems, and procedures. To effectively establish an innovative culture, organizations should continuously implement innovation management practices. Only in this way can innovation become an organization's dominant culture. Because innovation management practices increase the commitment to innovation, they facilitate the formation and development of an innovative organizational culture and eventually become the fundamental values of the organization. In this study, we posited that innovation management constitutes the basis for the formation of an innovative organizational culture and analyzed this hypothesized relationship. For this purpose, we collected data using the face-to-face survey method with 200 white-collar staff members working in logistics companies that operate in Mersin, Turkey and that apply innovative management practices. We assessed the collected data using SPSS 20.0 (Statistical Package for Social Sciences) and AMOS 24.0 (Analysis of Moment Structures) programs. Our analysis showed a highly significant positive relationship between innovation management and innovative organizational culture.

Keywords
Innovation Management, Innovative Organizational Culture, Logistics

Introduction

Innovation management is one of the tools organizations use to survive in today's highly competitive business world. Successful innovation management practices can eventually become a part of an organizational culture. In short, in order for organizations to adapt to changing environmental conditions and succeed, they need to behave in innovative ways that align with the changes in the environment and effectively manage the situations they face. In a dynamic environment, innovation can be a handy and effective management tool

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for managers. Positive organizational cultures that support innovative products and services eliminate organizational weaknesses and enable organizations to react positively to changing market conditions.

Innovation management is a useful tool for improving the abilities of organizations. However, this useful tool needs to be managed effectively. When a new innovation approach is adopted within the scope of innovation management, it must be ensured that the employees be brought together and that the new approach be adopted by them for the internal adaptation process of this approach to be completed successfully. In addition, to successfully implement innovation management and ensure that innovations are integrated into organizational cultures, managers must encourage their employees to support innovation and demonstrate a strong vision in this respect. Thus, organizations that turn into innovative companies create business environments that promote innovative cultures, and the cultivation of such innovative cultures within organizations maximizes the professional skills of the organizations' employees.

Because innovations yield results by means of innovation management and because companies benefit from these innovation activities at the highest levels, companies must adopt innovation management as an essential corporate strategy. To sustain cultures of innovation, it is necessary to make high-impact innovations and destroy existing organizational bureaucracies. Thus, every fundamental innovation and change will contribute to the formation of strong and creative organizational cultures. The innovative organizational culture thus formed will provide the organization with the means of good strategic management in terms of creating and implementing advanced ideas. Innovation management and innovative organizational cultures also play important roles in shaping organizations' human resource structures.

We conducted this study to demonstrate that innovation management practices, which inevitably result from changes in environmental conditions, shape organizational cultures after a certain period of time; we therefore analyzed the relationship between innovation management and innovative organizational culture. The findings of our analyses indicate that organizations should cultivate organizational cultures that are open to research that leads to innovation because organizational cultures are great platforms for innovation and change.

Innovation Management

Joseph Schumpeter (1930) is an acclaimed Austrian political economist whose study of "creative destruction" within industries helped lay the foundations for innovation management as a practice (Hörlesberger et al., 2007: 211). And then Tidd and Bodley (2002) described innovation management as a process of designing new ideas and widespread implementation of such ideas by the organization (Yi and Xiangyun, 2013: 24). Innovation management provides implementers with numerous approaches and frameworks to implement innovation in the best manner (Hirte and Roth, 2018: 115).

The effective management of innovation is a requirement for an organization to maintain its current status, attract desirable customers and attain competitive advantage over other players in the market (Haleem et al., 2018: 19). In an organization where innovation management is applied, managers mentor their employees and do not dictate their orders to them (Kalivas et al., 2013: 21).

Innovation management plays an essential role in the management of companies that face uncertainties as a result of increasing globalization and rapid changes in technology and the rapid integration of these changes into the business world (Chong and Chun-sheng, 2007: 2005). Innovation management requires systematic innovation at all organizational levels. The mission of innovation management is to channel innovation into organization. Knowing what happens in the course of innovation management gives us a variety of new ways to understand organizational reality. For these reasons, organizations must assess and understand innovation management (Morente and Ferràs, 2017: 642-645).

In order to ensure effective participation in innovation efforts, the management models that provide guidance in defining organizational processes to benefit from innovation opportunities throughout the organization are required to be adopted in that organization (Bagno et al., 2017: 637). Because the growth and performance of an organization depends on the effective management of innovation in a competitive climate (Taghizadeh et al., 2017: 130).

Innovation management consists of four dimensions: strategy, system, culture and ecosystem. While the strategy dimension includes the criteria of innovation management and the effects of intellectual property risk, the system dimension encompasses the management of thought and information among different innovation processes. Moreover, while the culture dimension is characterized by education, training and employee participation, the ecosystem dimension involves collaboration with partners, intellectual property management and the analysis of new technologies. These four dimensions certainly impact innovation processes (Hirte and Roth, 2018: 115). According to another common opinion, the sub-dimensions of innovation management include innovative leadership, innovation culture, innovation process and information management (Plessis and Pretorius, 2018: 1).

Many studies of innovation management have suggested that to mitigate the risks that innovation-oriented companies may face they must actively monitor, evaluate, analyze and seek to control future events (Etges and Cortimiglia, 2019: 364).

Innovative Organizational Culture

Groups in which people come together to attain specific goals and collaborate in systematic ways are called organizations (Ülgen and Mirze, 2014: 22). Organizational culture, meanwhile, is expressed via the beliefs and values within companies that motivate employ-

ees and increase job productivity (Owoyemi and Ekwoaba, 2014: 169). In other words, an organizational culture is the standard set of behaviors and habits shared by the members of an organization. Organizational culture serves as social cement for the life of an organization. It also serves as powerful management tool in organizations that allow their members to act independently and consistently. Organizational culture is one of the important determinants of sustainable innovation and financial performance (Davies and Buisine, 2018: 103).

Culture plays an important role in the cultivation of innovative success. To change their cultures, organizations must ensure that they define and assimilate the components of the innovative culture. These components of innovative culture include: innovative mission and vision statements, democratic communication, safe spaces, flexibility, collaboration, boundary spanning, incentives and leadership (Dombrowski et al., 2007: 190).

Asmawi and Mohan (2011), on the other hand, expressed the cultural components that helped research and development as an eight-factor structure. Asmawi and Mohan (2011) have defined these factors respectively as teamwork and knowledge sharing, empowerment and recognition, conformity and impediments to R&D, risk-taking, customer orientation, autonomy, social networking and organizational design. They also showed in their research that these dimensions can be used as a management tool to measure the basic culture of research and development type organizations. They stated that R&D managers can benefit from these eight factors while forming the basis of the research culture in their units and this will also provide a basis for management to take the initiative to manage R&D activities. They also showed that these factors can be used as benchmarking parameters in comparing various aspects of organizational culture of research and development companies with enterprises that are leaders in the industry (Asmawi and Mohan, 2011: 509).

Innovative culture is a special form of regulation that makes innovation a natural process in the organization and promotes innovation for employees at all levels. Innovative culture has its own characteristics. These characteristics include: the presence of innovative leaders, managers, teams and individuals; the proper organizational conditions for innovation; and the establishment of multiple and easy connections outside the organization for innovation. All of these characteristics are based on innovative and exploratory capabilities (observing, questioning, networking, experimenting and partnership). To create an innovative organizational culture in an organization, these capabilities must be extended to the whole organization (Davies and Buisine, 2018: 103). At the same time, in order to create an innovative organizational culture in an organization, six kinds of attitudes must be fulfilled. These attitudes include the ability of managers to take risks, encouraging creativity, the participation of all employees to create an innovative culture, holding both managers and their employees accountable for their behaviors, allowing employees to develop themselves based on their areas of interest, and using employees' unique talents to more effectively fulfill the company's mission (Szczepańska-Woszczyna, 2014: 31).

Maher (2014) has set forth seven important differences of highly innovative organizations as follows. Organizations and leaders use these seven characteristics to strengthen and assess the culture of innovation in their organizations. The seven important differences set forth by Maher (2014) for highly innovative organizations are as follows:

- employees should express their ideas without fear that such ideas may have negative consequences and should think that they can try out new ideas;
- leaders of innovative organizations should be more interested in learning by learning from mistakes than punishing negative consequences;
- top management should provide the financial resources employees require to carry out innovation processes and demonstrate positive attitudes towards innovation;
- because information is a crucial resource for innovation, the organization should create an environment that facilitates the extensive and systematic gathering of information inside and outside the organization, and that make said information easily and quickly accessible and clearly communicated;
- the leader should clearly indicate that innovation is a desired goal of the organization and create a motivated team to implement the organization's vision;
- innovation should be supported by symbols and rituals that define and promote it; and
- in organizations with high innovation based efficiency, innovation is actually the product of the managers' logic of using a practical management tool. Leaders must consider how to identify and put into practice the potential and capabilities of employees who understand creative thinking, management and management methods. Leaders must also cultivate a collaborative business environment to fuel innovation in their organizations. In short, different ways of thinking and different perspectives and diversity will provide leaders with a solid foundation for innovation (Szczepańska-Woszczyna, 2014: 31-32).

Research Methodology

Purpose and Importance of the Research

In this study, we examined the relationship between innovation management and innovative organizational culture in the logistics sector. Additionally, we set out to show the decision makers of logistics companies that innovation management can improve their companies'

positions in the market, give them competitive advantages, and enhance their corporate images. In summary, we conducted this study to demonstrate that logistics companies can make innovation the defining characteristic of their organizational cultures by implementing innovation management.

Population and Sample of the Research

Today, the logistics sector has a very important place in the functioning of the global economy. In international trade, product movement takes place through logistics processes. Because of this feature, the logistics sector has connection with every field in the global economy. Thanks to these connections, every innovation or change in business affects the logistics industry. For this reason, innovation is experienced intensely in the logistics sector. Due to this feature of the sector, the logistics sector was preferred in this study.

The population of the research is the logistics companies operating in Mersin and the sample consists of the logistics companies that operate in Mersin and have implemented innovation management. The reason for choosing these logistics companies is the absence of such a study on this sample relating to the subject until today and that the region is one of the most important logistics centers of Turkey. Mersin is a complete logistics center with land, sea and air transportation. It ranks first as the largest container port of Turkey (MIP, 2018). It is also one of Turkey's most important logistics centers as a bridge between the Middle East and European markets. For this reason, many of the logistics companies operating in Mersin have gained corporate identity and are the most important logistics providers known worldwide. International and domestic competition of these companies forced them to give importance to innovative actions and to implement innovation management in their companies.

For this reason in the sample selection of our study, the factors such as companies' being corporate and open to innovations, their adoption of innovative management as their principle, managers' continuously doing research for innovation, usage of the most advanced system software in areas such as inventory management, accounting and operations, giving importance to the usage of environmental friendly tools, loading/lifting equipment's complying with current technologies, giving importance to training of personnel regarding areas such as work safety, personal development and professional issues, dominating in the market and employing people who are experts in their fields, have been effective. As can be seen, the sample of the research consists of logistics providers who realize the importance of innovation management practices and apply them to their businesses. For this reason, in the study, large corporate companies that have managers who realize the importance of change and transformation and apply innovation management in their companies formed the sample of our research. For this reason, in this study, a purposeful sampling method being among non-probable sampling methods has been used. In the research, data were collected from

200 white-collar personnel working in logistics companies operating in Mersin, which were registered with the International Transport and Logistics Service Providers Association (UTIKAD) and which have implemented innovation management.

Data Collection Method

We obtained the data necessary to test our hypotheses using the face-to-face survey method with the sample group. The survey consisted of three sections: demographic data, an innovation management scale and an innovative organizational culture scale. It included 46 questions in total.

For the innovation management scale, we used the 26-item scale developed by Gürsel & Sü Eröz (2017). This scale contains 5-point Likert-type items with the following possible responses: "1- Strongly disagree," "2- Disagree," "3- Neither agree nor disagree," "4- Agree," or "5- Strongly agree."

For the innovative organizational culture scale, we used 8 expressions that are listed in the Organizational Culture Index developed by Wallach (1983) and that help evaluate the innovative organizational culture. This scale contains 5-point Likert-type items with the following possible responses: "1- Strongly disagree," "2- Disagree," "3- No idea," "4- Agree," and "5- Strongly agree."

Model and Hypotheses of the Research

This study's dependent variable was innovative organizational culture and its independent variable was innovation management. The sub-dimensions of innovation management include innovation performance, innovation capability, innovative organizational structure, participation in innovation processes, innovation desire and innovation support.

We list the hypotheses generated to investigate the relationship between the dependent and independent variables and the relationship between demographic factors and the dependent variable below. In addition, Figure 1 shows the study's conceptual model related to these hypotheses.

Figure 1. Research Model and Hypotheses

This conceptual model is based on Schumpeter's idea of creative destruction relating to entrepreneurship. These ideas, put forward by Schumpeter, formed the foundations of innovation management (Hörlesberger et al., 2007: 211). Later, by making use of Soren Kaplan Schumpeter's creative destruction idea, studies were conducted showing that innovation management had a great impact on innovative organizational culture (Kaplan, 2017).

Hypotheses of the Research

H_{1a}: There is a significant relationship between innovation management and innovative organizational culture.

H_{1b}: Innovative organizational culture improves as innovation management practices increase.

H_{1c}: There is a significant relationship between a company's innovation performance and its innovative organizational culture.

H_{1d}: There is a significant relationship between a company's innovation capability and its innovative organizational culture.

H_{1e}: There is a significant relationship between a company's innovative organizational structure and its innovative organizational culture.

H_{1f}: There is a significant relationship between employees' participation in innovation processes and a company's innovative organizational culture

H_{1g}: There is a significant relationship between the employees' innovation desires and a company's innovative organizational culture.

H_{1h}: There is a significant relationship between a company's innovation support and its innovative organizational culture.

H_{1k1}: Innovative organizational culture varies by gender.

H_{1k2}: Innovative organizational culture varies by marital status.

H_{1k3}: Innovative organizational culture varies by age.

H_{1k4}: Innovative organizational culture varies by educational status.

H_{1k5}: Innovative organizational culture varies by employment period.

H_{1k6}: Innovative organizational culture varies by job position.

Data Analysis Methods of the Research

We analyzed the data in this study using frequency analysis, normality analysis, correlation analysis, regression analysis, independent-sample T Test, one-way ANOVA analysis, and validity and reliability analyses.

Frequency Analysis

Table 1 lists the descriptive statistics of the employees in the sample.

Table 1
Descriptive Statistics- 1

	Frequency	Percentage	Cumulative Percentage
Gender			
Male	113	56,5 %	56,5 %
Female	87	43,5 %	100,0 %
Age			
Under 20	2	1,0 %	1,0 %
20-29	59	29,5 %	30,5 %
30-39	103	51,5 %	82,0 %
40-49	29	14,5 %	96,5 %
50 and above	7	3,5 %	100,0 %
Educational Status			
High School	23	11,5 %	11,5 %
Undergraduate	38	19,0 %	30,5 %
Graduate	103	51,5 %	82,0 %
Postgraduate	36	18,0 %	100,0 %
Marital Status			
Married	111	55,5 %	55,5 %
Single	89	44,5 %	100,0 %
Employment Period			
Less than 1 year	21	10,5 %	10,5 %
1-5 years	87	43,5 %	54,0 %
6-10 years	59	29,5 %	83,5 %
11-15 years	26	13,0 %	96,5 %
16-20 years	4	2,0 %	98,5 %
21 years and more	3	1,5 %	100,0 %

As Table 1 shows, 56.5% of the sample was male and 43.5% was female. Young employees aged 20-39 years comprised 81% of the sample. In addition, a significant majority of the participants, 88.5%, graduated from university. There was no dominance in the distribution of marital status among the groups. Meanwhile, 43.5% of the employees in the sample had 1 to 5 years of work experience.

Table 2 shows additional descriptive statistics for the employees who participated in the study.

Table 2
Descriptive Statistics- 2

	Frequency	Percentage	Cumulative Percentage
Monthly Salary			
TRY 1501 – 2000	42	21 %	21,0 %
TRY 2001 – 3000	89	44,5 %	65,5 %
TRY 3001 – 4000	39	19,5 %	85,0 %
TRY 4001 and above	30	15,0 %	100,0 %
Job Position			
Manager	13	6,5 %	6,5 %
Domestic Logistics Operation Personnel	22	11,0 %	17,5 %
International Logistics Operation Personnel	26	13,0 %	30,5 %
Documentation Personnel	18	9,0 %	39,5 %
Officer	47	23,5 %	63,0 %
Chief	29	14,5 %	77,5 %
Domestic Sales Personnel	19	9,5 %	87,0 %
International Sales Personnel	7	3,5 %	90,5 %
Pricing Personnel	8	4,0 %	94,5 %
Other	11	5,5 %	100,0 %

As Table 2 shows, the vast majority of the employees in the sample had monthly incomes between TRY 2001 (Turkish liras) and TRY 3000. Regarding job position, the results showed that officers and chiefs were more dominant in the sample, with 23.5% and 14.5% respectively. Meanwhile, the percentages of employees in other positions were fairly close to one another.

Validity and Reliability Analysis

In order to determine the structural validity of the scales used in the study, Confirmatory Factor Analysis (CFA) was applied and the recommended fit values obtained as a result of the factor analysis for the innovation management scale consisting of 26 items are given in Table 3.

Table 3
Innovation Management Scale / Recommended Fit Values

Fit Criteria	χ^2	p	χ^2/sd	RMSEA	CFI	IFI	SRMR	NFI	GFI
Recommended Fit Values	385,312	0,01	2,335	0,08	0,857	0,902	0,05	0,840	0,900

As Table 3 shows, for the recommended fit values of the innovation management scale, the chisquare value was 385.312, the p value was 0.01, the RMSEA value was 0.08, the GFI value was 0.900, the chisquare/degree of freedom was 2.335, the IFI value was 0.902, the SRMR value was 0.05, the CFI value was 0.857, and the NFI value 0.840. Figure 2 shows the standardized solution values relating to the tested innovation management scale.

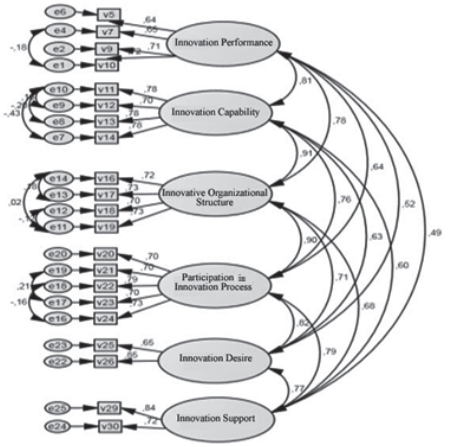

Figure 2. Innovation Management Scale / Standardized Analysis Values

Table 4 shows the recommended fit values obtained by applying Confirmatory Factor Analysis to the innovative organizational culture scale, which consisted of eight items.

Table 4
Innovative Organizational Culture Scale / Recommended Fit Values

Fit Criteria	χ^2	p	χ^2/sd	RMSEA	CFI	IFI	SRMR	NFI	GFI
Recommended Fit Values	21,041	0,05	1,753	0,06	0,975	0,976	0,03	0,946	0,970

As Table 4 shows, for the recommended fit values of the innovative organizational culture scale, the chi-square value was 21.041, the p value was 0.05, the RMSEA value as 0.06, the GFI value was 0.970, the chisquare/degree of freedom was 1.753, the IFI value was 0.976, the SRMR value was 0.03, the CFI value was 0.975, and the NFI value was 0.946. Figure 3 shows the standardized solution values relating to the tested innovation management scale.

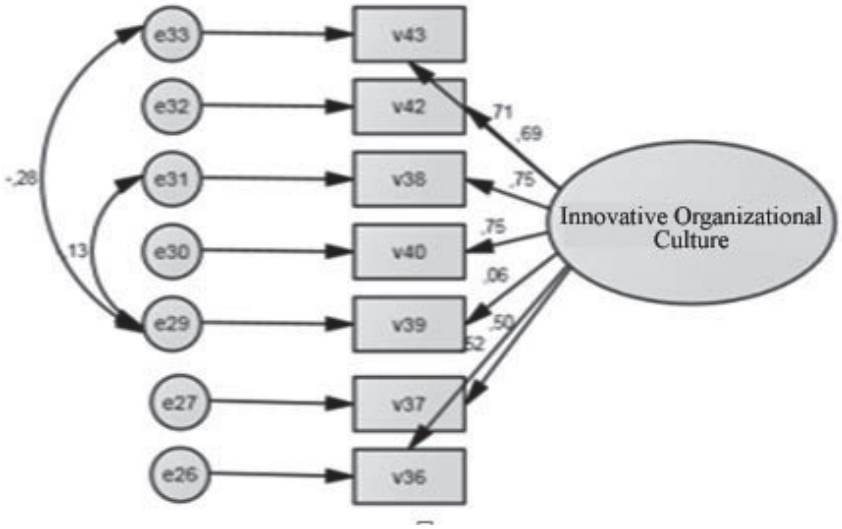

Figure 3. Innovative Organizational Culture / Standardized Analysis Values

We determined that the recommended fit values of the innovation management scale given in Table 3 and the recommended fit values of the innovative organizational culture scale given in Table 4 were in accordance with the goodness of fit statistics published by Schermelleh Engel et al. (2003) and the structural validity of the scales used in the study were therefore at an acceptable level.

After completing the Confirmatory Factor Analysis, we removed 5 items from the innovation management scale and 1 item from the innovative organizational culture scale. Table 5 shows the values obtained as a result of the reliability analysis performed for these scales whose structural validity was established.

Table 5
Reliability Analysis

	Cronbach's Alpha	**N of Items**
Innovative Organizational Culture Scale	0.728	7
Innovation Management Scale	0.935	21
* Innovation Performance	0.763	4
* Innovation Capability	0.821	4
* Innovative Organizational Structure	0.813	4
* Participation in Innovation Process	0.847	5
* Innovation Desire	0.712	2
* Innovation Support	0.752	2

As Table 5 shows, the Cronbach's Alpha coefficients were 0.728 for the innovative organizational culture scale, 0.935 for the innovation management scale, 0.763 for the innovation

performance dimension, 0.821 for the innovation capability dimension, 0.813 for the innovative organizational structure dimension, 0.847 for the participation in the innovation process, 0.712 for the innovation desire dimension, and 0.752 for the innovation support dimension. These values verified that the scales used in this study were internally consistent.

Normality Analysis

Table 6 shows the Kolmogorov-Smirnov and Shapiro-Wilk values, derived from the normality test we conducted, and Table 7 provides the descriptive statistics. The Kolmogorov-Smirnov values in Table 6 indicate that the data obtained from all scales do not show a normal distribution.

Table 6
Normality Test Results

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Innovative Organizational Culture	0.098	200	0.000	0.983	200	0.017
Innovation Management	0.101	200	0.000	0.960	200	0.000
* Innovation Performance	0.138	200	0.000	0.951	200	0.000
* Innovation Capability	0.101	200	0.000	0.960	200	0.000
* Innovative Organizational Structure	0.176	200	0.000	0.924	200	0.000
* Participation in Innovation Process	0.118	200	0.000	0.970	200	0.000
* Innovation Desire	0.136	200	0.000	0.953	200	0.000
* Innovation Support	0.136	200	0.000	0.953	200	0.000

Table 7 displays the skewness and kurtosis values of the data obtained from the scales we used in this study. As the results in the table indicate, we found that the skewness and kurtosis values of the data obtained from the scales—which did not show a normal distribution based on the Kolmogorov-Smirnov value—were in the range of -2 to +2, thus showing a normal distribution based on the classification of George and Mallery (2003). For this reason, we used parametric techniques within the scope of the research.

Table 7
Normality Tests – Descriptive Statistics

		Statistic	Std. Error
Innovative Organizational Culture	Skewness	-0.280	0.172
	Kurtosis	0.349	0.342
Innovative Management	Skewness	-0.614	0.172
	Kurtosis	1.277	0.342
* Innovation Performance	Skewness	-0.777	0.172
	Kurtosis	1.688	0.342
* Innovation Capability	Skewness	-0.614	0.172
	Kurtosis	1.277	0.342
* Innovative Organizational Structure	Skewness	-0.956	0.172
	Kurtosis	1.677	0.342
* Participation in Innovation Process	Skewness	-0.491	0.172
	Kurtosis	0.569	0.342
* Innovation Desire	Skewness	-0.413	0.172
	Kurtosis	-0.130	0.342
* Innovation Support	Skewness	-0.413	0.172
	Kurtosis	-0.130	0.342

Correlation Analysis

Table 8 shows the results of the correlation analysis between this study's dependent and independent variables. As the results in the table indicate, our analysis showed a highly significant positive relationship between innovation management and innovative organizational culture. In addition, we found that innovative organizational culture had moderately significant positive relationships with innovation performance, innovation desire, and innovation support—the sub-dimensions of innovation management. We also found that innovative organizational culture had highly significant positive relationships with the innovation capability, innovative organizational structure and participation in the innovation process dimension. In most of the surveyed companies, the provision of the budgets necessary for innovation, the testing of innovative ideas, and personnel initiative impacted on the emergence of these significant relationships. Moreover, managers' willingness to support employees' risk taking and efforts to improve themselves supported this positive relationship.

Table 8
Correlation Analysis

		Innovative Organizational Culture
Innovation Management	Pearson Correlation	0.831
	Sig. (2-tailed)	0.000
* Innovation Performance	Pearson Correlation	0.557
	Sig. (2-tailed)	0.000
* Innovation Capability	Pearson Correlation	0.632
	Sig. (2-tailed)	0.000
* Innovative Organizational Structure	Pearson Correlation	0.642
	Sig. (2-tailed)	0.000
* Participation in Innovation Process	Pearson Correlation	0.603
	Sig. (2-tailed)	0.000
* Innovation Desire	Pearson Correlation	0.561
	Sig. (2-tailed)	0.000
* Innovation Support	Pearson Correlation	0.554
	Sig. (2-tailed)	0.000

Regression Analysis

Table 9 shows the ANOVA results of our multiple regression analysis of innovation management and innovative organizational culture. Our analysis indicated that the regression model was statistically significant because the F value of the model was less than 0.05.

Table 9
Innovation Management & Innovative Organizational Culture - ANOVA

	Sum of Squares		**Mean Square**	**F**	**Sig.**
Innovative Organizational Culture	Regression	1869.044	311.507		
	Residual	1526.351	7.909	39.389	0.000
	Total	3395.395			

Table 10 shows the results of the multiple regression analysis conducted using the backward method. As these results indicate, our analysis determined that 53.9% of the changes in the innovative organizational culture were explained by the changes in the five dimensions of innovation management. According to these results, the value of innovative organizational culture can be formulated as follows: "Innovative Organizational Culture = 5.960 + (0.239 x Innovation Performance) + (0.292 x Innovation Capability) + (0.393 x Innovation Support) + (0.286 x Innovative Organizational Structure) + (0.491 x Innovation Desire)"

Table 10
Innovation Management & Innovative Organizational Culture - Model

	Innovation Management	**β**	**t**	**Sig.**	**R^2**	**Adjusted R^2**
Innovative Organizational Culture	Constant	5.960	4.446	0.000	0.550	0.539
	Innovation Performance	0.239	2.229	0.027		
	Innovation Capability	0.292	2.360	0.019		
	Innovation Support	0.393	2.816	0.005		
	Innovative Organizational Structure	0.286	2.277	0.024		
	Participation in Innovation Process	-0.005	-0.048	0.962		
	Innovation Desire	0.491	3.141	0.002		

Based on the formula obtained from the regression analysis, we found that a 1-unit increase in the innovation performance dimension of innovation management led to an increase of 0.239 units in the innovative organizational culture, a 1-unit increase in the innovation capability dimension led to an increase of 0.292 units in innovative organizational culture, a 1-unit increase in the innovation support dimension led to an increase of 0.393 units in innovative organizational culture, a 1-unit increase in the innovative organizational structure dimension led to an increase of 0.286 units in innovative organizational culture, and an increase of 1 unit in the innovation desire dimension led to an increase of 0.491 units in innovative organizational culture. When evaluated together with the other dimensions of the innovation management, we found that the participation in the innovation process dimension had no significant effect on innovative organizational culture.

Independent-Sample T Test

Table 11 shows the results of our analysis of the relationship between innovative organizational culture and the gender of the participants. As the results in this table indicate, we found a significance value greater than 0.05, indicating that employees' perceptions of innovative organizational culture did not differ significantly based on gender. Perceptions of innovative organizational culture serve as indicators of uncertainty, the ability to tolerate reasonable mistakes, and the extent to which these errors are regarded as opportunities. In fact, the concept of innovative organizational culture is closely related to company management practices. This supports the validity of our finding of no relationship between perceptions of innovative organizational culture and gender.

Table 11
Innovative Organizational Culture & Gender / Independent-Samples T Test

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
Equal variances assumed	1.598	0.208	0.714	198	0.476	0.42142	0.58989
Equal variances not assumed			0.728	195.380	0.467	0.42142	0.57873

Table 12 shows the results of our analysis of the relationship between innovative organizational culture and participants' marital status. As the results in the table indicate, we found a significance value greater than 0.05, indicating that employees' perceptions of innovative organizational culture did not differ significantly based on marital status. Whether married or single, employees recognized that innovation practices became the organizational culture after a certain period of time.

Table 12
Innovative Organizational Culture & Marital Status / Independent-Samples T Test

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
Equal variances assumed	0.014	0.905	-1.402	198	0.162	-0.82205	0.58631
Equal variances not assumed			-1.396	185.485	0.164	-0.82205	0.58875

One-Way ANOVA Test

Table 13 shows the results of our analysis of the relationship between innovative organizational culture and participants' ages.

Table 13
Innovative Organizational Culture -Age / One-Way ANOVA Analysis

Innovative Organizational Culture		**N**	**Mean**	**Std. Deviation**	**Std. Error**	**F**	**Sig.**
	Below 20	2	25.5000	0.70711	0.50000	1.097	0.359
	20-29	59	25.3051	3.64008	0.47390		
	30-39	103	24.4660	3.82411	0.37680		
	40-49	29	23.4483	5.38905	1.00072		
	50 and above	7	23.8571	6.41427	2.42437		

As the results in Table 13 indicate, we found a significance value greater than 0.05, meaning perceptions of innovative organizational culture did not differ significantly based on employee age. The non-heterogeneous distribution of the age of the personnel was effective in this result.

Table 14 shows the results of our analysis of the relationship between perceptions of innovative organizational culture and participants' educational status.

Table 14
Innovative Organizational Culture - Education / One-Way ANOVA Analysis

Innovative Organizational Culture		N	Mean	Std. Deviation	Std. Error	F	Sig.
	High School	23	25.7826	3.74113	0.78008	0.932	0.426
	Undergraduate	38	23.9737	4.89062	0.79336		
	Graduate	103	24.5146	3.94537	0.38875		
	Post Graduate	36	24.5000	4.02492	0.67082		

As the results in Table 14 indicate, we found a significance value greater than 0.05, indicating that perceptions of innovative organizational culture did not differ significantly based on an employee's education level. Because Turkey's logistics industry has recently developed, this sector is in a very good condition in terms of the qualifications of the white-collar staff it employs. The level of training of white-collar staff in this sector is nearly uniform. In other words, most of the white-collar employees in this sector have graduated from the logistics departments of high schools, universities, and postgraduate programs. This enables employees to perceive the innovation activities related to their own fields and the transformation of these innovative efforts into organizational culture at an equal level.

Table 15 shows the results of our analysis of the relationship between perceptions of innovative organizational culture and the duration of participants' employment.

Table 15
Innovative Organizational Culture– Employment Period / One-Way Analysis

Innovative Organizational Culture		N	Mean	Std. Deviation	Std. Error	F	Sig.
	Less than 1 year	21	27.4286	3.27981	0.71571	3.925	0.002
	1-5 years	87	24.2989	3.46449	0.37143		
	6-10 years	59	24.0678	4.08050	0.53124		
	11-15 years	26	25.0385	5.77221	1.13202		
	16-20 years	4	19.2500	3.30404	1.65202		
	21 years and more	3	24.3333	1.52753	0.88192		

As the results in Table 15 indicate, we found a significance value less than 0.05 in both analyses, indicating that perceptions of innovative organizational culture differed significantly based on employment duration. More specifically, our analysis showed that perceptions of the innovative organizational culture were most positive among employees with less than 1 year of work experience and most negative among employees with work experience of 16-20 years. With the development of technology and increasing educational opportunities, youth today are more open and predisposed to innovation. Newly graduated individuals can recognize deficiencies in organizations, requisite innovations, and innovation attempts more easily

than older personnel who have gained a certain amount of experience. In other words, young employees tend to transform innovation into innovative organizational culture. Meanwhile, most employees who have worked for 16-20 years are closed to innovation because they do not want to change certain habits, and because they do not develop themselves, they have difficulty in perceiving the innovation attempts in the organization and transforming them into organizational culture. In addition, new employees bring fresh blood to organizations and cure the various forms of blindness that result from the long-term ordinary work routines of old employees.

Table 16 shows the results of our analysis of the relationship between perceptions of innovative organizational culture and participants' job positions.

Table 16
Innovative Organizational Culture & Job Position / One-Way ANOVA Analysis

Innovative Organizational Culture		**N**	**Mean**	**Std. Deviation**	**Std. Error**	**F**	**Sig.**
	Manager	13	26.2308	4.16641	1.15555	1.880	0.057
	Domestic Logistics Operation Personnel	22	26.6364	3.67158	0.78278		
	International Logistics Operation Personnel	26	25.1538	3.33097	0.65326		
	Documentation Personnel	18	24.0000	3.46410	0.81650		
	Officer	47	23.4043	4.31710	0.62971		
	Chief	29	23.7241	4.65139	0.86374		
	Domestic Sales Personnel	19	25.0000	4.29470	0.98527		
	International Sales Personnel	7	26.5714	2.14920	0.81232		
	Pricing Personnel	8	23.5000	3.58569	1.26773		
	Other	11	23.7273	4.81852	1.45284		

When Table 16 was examined, it was found that the significance value was greater than 0.05, and that therefore the perception of innovative organizational culture did not show a significant difference according to the job position. To foster an innovative organizational culture in an organization, all stakeholders must work in coordination with each other. In other words, if a staff member in a job position leads an innovation activity, the innovations that member brings to the organization will be adopted and applied by employees in other positions and these innovations will spread to the whole organization and contribute to the transformation of the organizational culture after a certain period of time. Thus, the finding that perceptions of the innovative organizational culture did not differ significantly based on job positions appears quite apt, since transforming innovations into an organizational culture depends on equal perceptions and internalization of the applied innovations by the employees in each position.

Discussion and Conclusions

Today, trade has become globalized in the fullest sense and the world has become almost a single market. In this environment, logistics companies must compete both with companies in their own regions and with companies from all around the world. This competition among logistics companies manifests in decreased sales prices resulting from increased customer demands, increased costs, and increased competition levels, all of which ultimately shrink profit margins. The only way logistics companies can tackle such difficulties and take the lead in competition in a sustainable manner is by implementing management approaches that internalize innovation and adopt it as a core principle. At the same time, logistics companies should keep up with scientific and technological innovations and adopt service differentiation throughout all their departments to provide inexpensive and high quality services to customers. In the face of these inevitable developments, company managers must replace traditional management strategies with modern approaches. Innovation and innovation management should be the main source for all logistics companies operating in national and international fields, because innovation feeds globalization and globalization feeds logistics. In short, ensuring that these three phenomena feed each other requires innovation. Innovation also feeds many logistics operations such as warehousing, transportation, inventory management, order management, accounting/financing, and information processing, and it increases the profitability and efficiency of logistics companies. The fact that innovation generates positive results for logistics companies highlights the importance of this study's investigation of this subject and related concepts.

From this point of view, it can be said that it is necessary or even obligatory to implement innovation management in an organization and to build an innovative organizational culture. The results of the study also support this. As a result of the study, it has been concluded that there is a relationship between innovation management practices and innovative organizational culture and that innovation management practices improve the innovative organizational culture. Values of innovation performance (b = 0.239), innovation capacity (b = 0.292), innovation support (b = 0.393), innovative organizational structure (b = 0.286) and desire for innovation (b = 0.491), being among sub-dimensions of innovative management, are concrete indicators of this situation. These concrete results from the study show that innovation management and its sub-dimensions are effective in transforming the existing organizational culture into an innovative organizational culture. Current studies on this subject in the literature also support this result. One of the studies available in the literature, with similar results, is the study conducted by Ceausu et al., (2017). In this study, Ceausu et al. (2017) pointed out that the focus of managers on innovation management encourages innovation throughout the organization and this is an effective factor in the formation of an innovative organizational culture (Ceausu et al., 2017: 2398). Davies and Buisine (2018) stated that the existing organizational culture could be transformed into an innovative organizational culture

by ensuring that potential innovation resources are increased within the organization through innovation management (Davies and Buisine, 2018: 102). Martins and Terblanche (2003) emphasized that behaviors that encourage innovation should be nurtured in order to create an organizational culture that stimulates innovation and creativity in an organization (Martins and Terblanche, 2003: 73).

This research in the logistics industry guides decision makers on how innovation management practices can be transformed into an organization's culture. In other words, the results obtained from this research give decision makers an idea of what steps can be taken to transform innovation into organizational culture. Innovation management practices recommended for decision makers for each sub-dimension of innovation management affecting the innovative organizational culture were determined as follows in this research. For the innovation performance sub-dimension, it is recommended to managers that they share information within the organization and thereby increase their innovation performance (Işık and Aydın, 2016: 86). Within the scope of sub-dimension of innovation capability, decision makers are advised to implement the talent management successfully. Because employing, training, and developing talented employees, keeping them in the company, providing career opportunities and operating a reward system contribute positively to the improvement of innovation performance. (Şahin and Özdoğan, 2015: 387). Within the scope of innovation support, the enterprise must be involved in activities such as supporting and developing new ideas, welcoming employees to take risks positively and pleasantly, supporting new projects with a high chance of failure. As can be seen, the support of top management is an undeniable fact in the employee's innovative behavior. Top managers working in this sector must support innovation management practices and develop their skills in this direction (Pelenk, 2017: 5). Within the scope of the innovative organizational structure, in order to establish an organizational structure where creativity is directed and supported, organization employees must be guided and supported in creativity dimension. What is meant by giving directions and providing support is reducing formalization and specialization as much as possible or innovation-oriented, facilitating the initiative of employees by avoiding hierarchy, strengthening the relationships and interaction between organizational sub-systems, and strengthening employees with more decentralization (participant management). Therefore, in terms of contextual elements, it is necessary to include creativity and innovation as a value in organizational culture, to set up an R&D unit or innovation team, to run them effectively and to build simple and flexible structures (Özdaşlı, 2010: 109). Within the scope of dimension of innovation desire, employees who desire to develop their work must be granted individual autonomy within the organization. Individual autonomy within the company will contribute to employees' efforts to improve their work, to generate new ideas and to successfully implement these ideas (Eren and Kılıç, 2013: 226). In addition to these dimensions mentioned, it was determined in this study that the working time of the employees was also effective on the innovative organizational culture.

It is considered that sharing the results of this study with the managers in the logistics industry would contribute to the development of professional management and innovative leaders. This study also has significant value in terms of the fact that it shows the managers that innovative organizational culture, being an outcome of innovative management and innovative management practices, is a beneficial tool that can be used in managing a company, because one of the tools that provide useful outcomes for the enterprise is innovation management practices. In addition, the fact that there are very few studies in the literature that examined the relationship between these two concepts and that this subject has never been applied in the logistics sector until today, it is another contribution to the sector provided by this study.

Overall, our findings suggest that innovation and innovation awareness should be instilled in business owners, managers, and all other personnel. Innovation management should be implemented in all departments to cover all areas of business in logistics companies as well as companies operating in other sectors and organizations should seek to transform innovation management into an organizational culture. Today, due to the increasing number of logistics companies and the continuous development of technology with each passing day, managers need to closely follow developments and integrate what they see and learn into their companies.

Within the scope of the research, the results of the hypothesis tests performed to determine whether the difference between the two groups or the change over time is random are detailed in Table 17.

Table 17
Test Matrix of Research Hypotheses

Hypothesis	Result	Sig.	Hypothesis	Result	Sig.
H_{1a}	Accepted	0.000	H_{1h}	Accepted	0.000
H_{1b}	Accepted	0.000	H_{1k1}	Rejected	0.476
H_{1c}	Accepted	0.000	H_{1k2}	Rejected	0.162
H_{1d}	Accepted	0.000	H_{1k3}	Rejected	0.359
H_{1e}	Accepted	0.000	H_{1k4}	Rejected	0.426
H_{1f}	Accepted	0.000	H_{1k5}	Accepted	0.002
H_{1g}	Accepted	0.000	H_{1k6}	Rejected	0.057

It is recommended that this study, which examines the relationship between innovative management practices and innovative organizational culture, be conducted especially in other sectors with higher rates of change and innovation, on a larger sample scale and on people working in management positions. Having reached in the study only the logistics companies which operate in the city of Mersin and which apply innovative management, and the presence of companies, among the ones reached, who did not want to contribute to the research constitute the limitation of the research.

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RESEARCH ARTICLE

Drivers, Challenges, and Integration of Health 4.0 Societal Engagement: Evidence from Turkey

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Abstract
In Turkey, a novel concept like Health 4.0 is a potential candidate seeking a solution. This paper aims to identify the scope of Health 4.0 via the perceptions gathered from appropriate vignettes with the focus of IoT stand and with the help of a qualitative approach in the first phase of the hybrid methodology. In the first phase of the study, the authors revealed the drivers and challenges of Health 4.0 by asking for the scope and awareness of Health 4.0. In the second phase of the study, the given replies to the vignettes (possible real-life scenarios) were classified into four main criteria that serve several challenges towards the adoption of Health 4.0, which were evaluated by the MACBETH (Measuring Attractiveness by a Category-Based Evaluation Technique) approach to identify main and sub-challenges towards the concept. In doing so, by analyzing in a multicriteria method, results would help to recheck and undermine the current debates around the Health 4.0 concept, helping to form many applicability levels in the future. The results revealed that security was the most important criteria followed by education, confidentiality, and the politics/manageability criteria as being the least important challenge.

Keywords
Health 4.0, Sustainable Integration, Multi-Criteria Decision Making, Strategic Management, MACBETH

Introduction

Todays' wisdom is "Change is manageable," which has already progressed in our lives. This wisdom is in the word of the revolution itself that Industry 4.0, the novelist enabled a new vision in numerous industries and areas (Liao et al., 2017) As it has mostly impacted the manufacturing sector already, there is a forthcoming impact not only economically but also socially in general (Xu and Chen, 2017; Xu et al., 2018). Industry 4.0 vision, if affordable and accessible, would change the prosperity of society. However, we all need to adopt the digital world by defining the drivers and challenges that are covered by the term Industry 4.0- the

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digital infrastructure that enables benefits from the potential opportunities (Tortorella et al., 2020; Hathaliya and Tanwar, 2020). Every change has its resistance; therefore, we need to have a better understanding of Industry 4.0 areas which will also help us to have a manageable future in a collective approach.

One of the main concepts derived from Industry 4.0, being a bridge between social and economic conditions, is Health 4.0 approach. It has also taken its roots from innovation; however, it has a broader scope in the societal area (Wehde, 2019). Health 4.0 also means an essential change in the relations of stakeholders. In other words, it is not merely based on the infrastructure of Industry 4.0, but also an embedded version of consumers and providers. To be able to adapt, the providers and consumers need to work closely. By doing this, the opportunities and the challenges can be altered, and the socio-economic aspects ensured (Nair and Dreyfus, 2018). For instance, Health 4.0 is one of the central veins of human life that needs a better understanding of both growing and emerging countries.

It is the purpose of this research to assess the awareness of the Health 4.0 concept by revealing the drivers, challenges via the basis of Industry 4.0, and to frame strategic logic for better integration in the future in the context of individual perspectives. This present work makes several contributions to understand Health 4.0, which is a relatively novel concept for Turkey. As Health 4.0 is understudied (in Turkey) to date, such a dynamic is needed to investigate the multiple development levels (economic, social, and technological), as suggested in the research.

The second contribution of this work; providing a general framework of Health 4.0 addressing practitioners, decision-makers, and all stakeholders who are engaging in the Health 4.0 concept as well as academics as the current situation is the subject is understudied. Future agenda is considerably occupied for an emerging and aging country, Turkey, should act proactively as similar challenges are just several steps away from population aging countries are facing today (Meyer, Torssander, Talbäck, and Modig, 2019).

Due to scarcity of studies that investigate Health 4.0 and the drivers and challenges in emerging economies, two research questions are proposed:

RQ1: What are the drivers and challenges to achieve a possible healthcare system? (Implicit process and outcomes- a definition of the ecosystem of Health 4.0 and awareness of Health 4.0) and RQ2: What factors exist in Turkey that leads to meaningful outcomes in terms of Health 4.0? (e.g., legal, technological, societal, political? etc.)

To answer these questions, two studies are planned in a hybrid manner. This study explores the consequences faced by an individual who is concerned with the healthcare of the parents through vignettes in a qualitative study (RQ1), and with the findings of study 1, a

quantitative study (RQ2) was conducted to reveal the embedded knowledge in Health 4.0. These consequences are reflected in terms of individual, institutional, and societal levels of thought that may enable to sequence design of Health 4.0 drives, challenges, and integration within the given country by raising prospective alternatives of healthcare. The use of the hybrid approach and the factors resulting to guide efforts and resources which are especially important in an emerging economy concept that is to be counted the importance of this work.

Health 4.0 by the Roots of Industry 4.0

There is no doubt that as the population of the world is proliferating with a high life expectancy rate even in emerging or developed countries. According to OECD, the life expectancy of people over 65 and 80 years is increasing as well. As it may seem a development at first glance, it is also a challenge for the countries and societies to be managed due to the lower fertility rates. People getting older with fewer babies being born is considered in the old-age dependency ratio concept, which is predicted to increase in the coming 30 years. With the increase of this ratio, the concern of health care arises, the hospital beds, the average length of stay in the hospital, outpatient care, long term care, qualified care workers, etc., issues occur. Therefore, Healthcare is an economic burden for the countries needed to be projected to maintain the wealth of society. There is no denying that healthcare spending is dependent on aging, so health costs are to be planned with much greater attention. Even though health care spending is a burden, on the other hand, we need to consider it as a growing economy as well. It is a challenge for the nations' budget but also an opportunity for commercial industries and individuals.

Here where Industry 4.0 contributes to the health care system. Bearing in mind that technology not only reduces costs, but it is also a vision, not a trend to be precisely defined. Reducing administrative costs, reducing the time spending on documentation or diagnosing or operation on one hand, but creating value-added services for the individual for a better-quality life on the other. It is hard to give a precise definition for the complex nature of new manufacturing technology affecting the long term health of society because of the many facets. One needs to stress that if one considers Health 4.0 an utmost importance, surely that will serve better for our coming years. To be able to do that, its broad meaning and vision as a life philosophy needed to be understood.

As a vision, Health 4.0 can be defined in a value chain, not just framed by hospital, insurance, and pharmaceutical dimensions. If you fragment the care system from hospitals, there are many segments (all can refer to an opportunity) such as social care, psychotherapists, day clinics, community nurse nursing homes or informal carers, etc. Through revolution 4.0, communication became the utmost priority to create value in any process as in the health care industry. The vision started with the technologies powered by industrial revolutions. The

range of equipment, medicine, healthcare, health logistics, financial, and social systems are all correlated with the Industrial revolutions (American Institution for Medical and Biological Engineering, 2019).

Table 1
Possible Correlation of the Industry Revolutions and Healthcare Technologies

Industry 1.0 *Mechanization*	flexible tube stethoscope (the 1840s), piston syringe (1850s), and portable clinical thermometer (1860s).
Industry 2.0 *Electrification*	such as X-ray imaging (the 1890s), sphygmomanometer (1890s), electrocardiograph (1900s).
Industry 3.0 *Automation*	brightness mode ultrasonography (the 1960s), implantable pacemaker (1970s), X-ray computed tomography (1970s), magnetic resonance imaging (1980s), artificial heart (1980s), Positron Emission Tomography (1980s),
Industry 4.0 *Cyber-Physical Systems*	cyber-physical systems, IoT and services, AI, big data, robotics, bio-three dimensional (3-D) printing, connected wearable devices

Source: Adapted from Pang et al. (2018)

The embedded relation of Industry and Health revolutions diverge us to identify the drivers that can be investigated on the same basis.

Drivers of Health 4.0

The drivers of Industry 4.0 are established in a working paper as a literature review by the Audi Foundation Professorship at the Technical University of Dortmund in 2015 (Hermann, Pentek, and Otto, 2016). Interoperability occurs as the first driver that enables machine and human connection over IoT and IoS, Cyber-Physical systems, and also Smart Factory as in Industry 4.0. It is crucial that all levels of information should flow smoothly so that the entire system can work. Thus, providing all relevant data to meaningful information such as medical devices to reach more accurate data to enable better service or diagnosis as in Health 4.0 (Alshurafa et al., 2013). Interoperability is the leading enabler of the pervasive and preventive healthcare notion of Health 4.0. By wearing a device, the connection can be stabled and data forms the health records can be distributed. Therefore, data analytics present our healthcare services and capabilities with more possibilities. Not only with real time information but also with the cyber-physical system sensing information via scenarios will telehealth and remote caring under the scope of pervasive and preventive healthcare be provided (Pang, Yang, Khedri, and Zhang, 2018).

Hence there occurs another new issue in medicine and human society, dependence on the real-time data and analyzing and creating personal healthcare records combined with other biosystems (Yang and Cui, 2018). This scope is out of the authors' professional title (biodesign and manufacturing focus on that). Instead, the authors focus on the consciousness-raising part of human society on the individual level, presupposition, individuals facing more personalized and precise healthcare (diagnosis and treatment) via interoperability of IoT and

Cyber-Physical Systems. This view is also identified as the real-time capability driver of Industry- Health 4.0 so forth. Real-time capability is related to the possible out-of -hospital treatment where patients are given the exact amount of medication required with maximum therapy but minimum side effects. Personalized medicine, smart pharmaceuticals, and supply chain management can only be implement via clearly defined real-time capability.

The customer-oriented view is also a principle of Healthcare. Combination of big data, collecting data from all wearable sensors, smart inhalers, insulin pens around the world, enable knowledge on diseases, their progress, and cures. Therefore prevention, personalized care, precise, predictive, and participatory health concepts are all combined in the service-orientation driver. This driver enables the pharmaceutical companies, algorithms (e.g., Google), and service providers (5G) to act in health care vendors distributing and leveraging service aggregation around the world. Modularity is the other driver referring to the flexibility to adapt to changing requirements by replacing and individual modules helping to create new functionalities for stakeholders (e.g., Google software as edge clouds). In doing so, decentralized decision making to reduce latency and enhance security supported. In recent years most European countries included Turkey, launched the e-Health system to enable patients and health institutions to reach the information. However, it is not connected to any other network yet, but the accessibility of your medical records is a huge step (e.g., Turkey E-Health). It can be foreseen that the system in England is going to be distributed to many parties such as patients, professionals, and formal and informal carers who are using sensors, smart devices, smartphones, applications, and cyber-physical systems increasingly (NIB, 2014). For instance, when the new applications, designs, and solutions emerge in one country, isomorphism interoperate. However, the norms and the standards should be considered to each country's cultural values as they are the bricks building the revolutions (e.g., Industry/Health 4.0) on a reliable basis—this the hypothesis to be systematically checked and explained not in this paper but further (Michael, K., Gokyer, D., and Abbas, S., 2018).

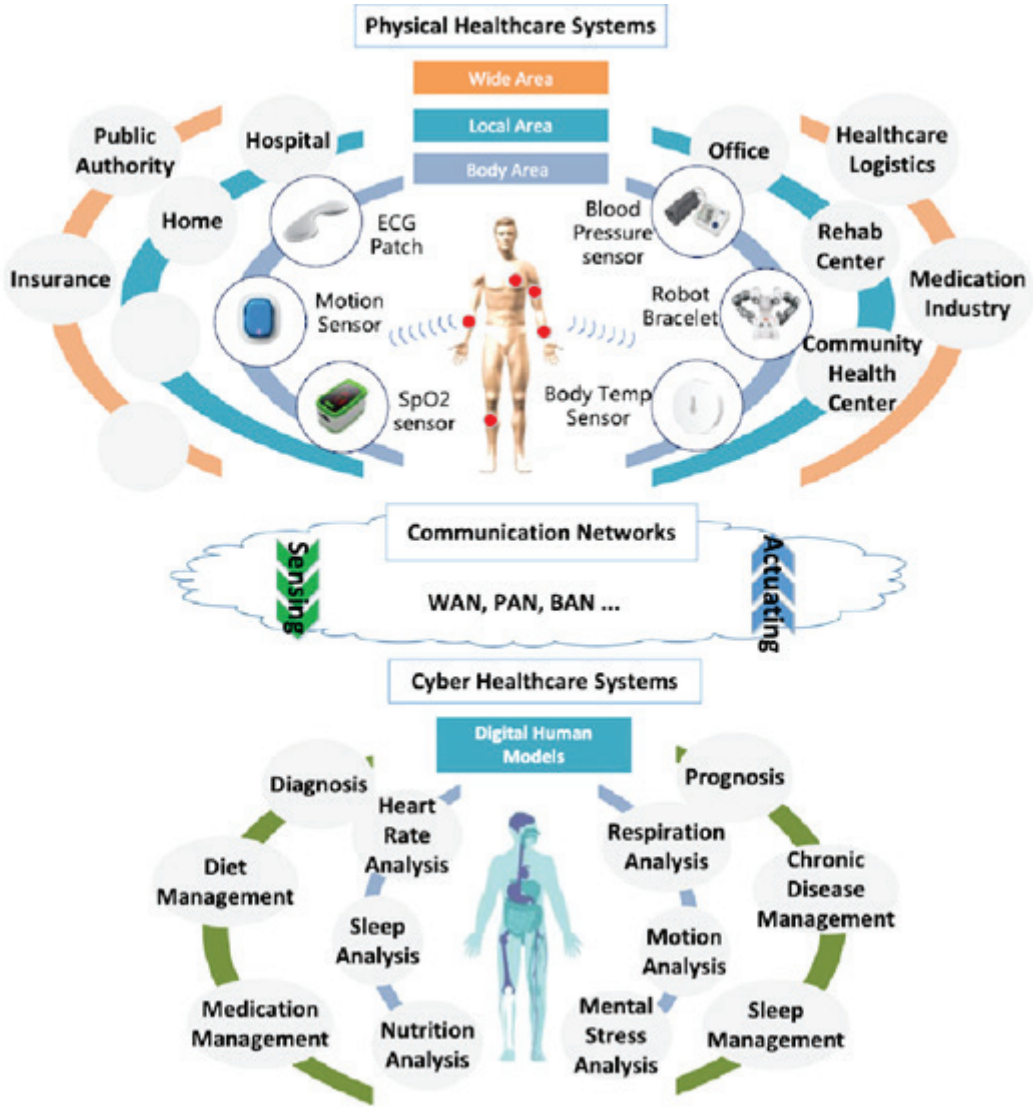

Figure 1. Illustration of Health 4.0 Concept Source: Pang et al. (2018) (with permission)

Challenges of Health 4.0

There are many facets of challenges in terms of the unit of analysis of the Health 4.0 concept. Although focusing on the concept with the lens of industrial revolutions, not only in one unit but as a philosophy inholding individual, institutional, societal levels (United Nations, 2006); enables us to see the determinants and the big picture, itself conjointly based on a holistic approach.

Table 2
Challenges of Health 4.0 on levels

Challenges	Details	Unit of Level
Exchange and security of data	*Regulation and standards to be set* - governance and liability issues - the contribution to the development of sustainable health programs	Society
Demographic developments	*Decentralization in Healthcare* - hospital beds in decline - the number of surgeries increasing - the increasing number of patients are being treated in day clinics, their homes, and over the internet.	Society/ Institutional
e.g., IoT Devices (Healthcare Information Technologies)	*Trust, Accuracy and Suitability Issues* - whom to trust? (internet or doctors) - more and more electronic devices are sold to measure fitness and well-being, - the number of health and wellness applications increasing, - usage of apps is rising, but the trust is being questioned.	Institutional/Individual
Lack of Awareness	*Education and training needed* - patient education on self-management of health, illness, wellness, etc. - setting up new health goals, - patients are to be ready to understand and consent to new practices and responsibilities - healthcare providers to be trained to serve under new technologies	Individual/Institutional
Concern of Manageability	*A manageable future* - next-generation mobile network services (5G) settlement. - all stakeholders' ultimate gain so, a collective approach is needed, - economic opportunities vs. socio-economic challenges. Which comes first? - healthcare spending average ratio of GDP is increasing	Society/ Institutional/ Individual

Source: Adapted from Thuemmler and Bai (Ed. 2017), Health 4.0: How Virtualization and Big Data are Revolutionizing Healthcare (Thuemmler and Bai, 2017), and created by the authors.

As those challenges may refer to an information revolution, e.g., with the help of digital technologies, our way of purchasing has changed (having groceries delivered to the door, investing money through an app., etc.).

We stand as the touchstone of all changing technologies; for us, this means achieving better as we do things for final users.The better we accommodate the challenges into opportunities, the better we manage the new requirements as in multifaceted levels mentioned above, on individual, institutional, and societal levels. Besides, challenges among all those levels can be overcome through segmentation such as technical, ethical, legal, political to

frame the effects and the frameworks of manageability. For this reason, it is not only the focus of computer or engineering science but also social science such as business administration, sociology, psychology, public administration, communication and education that should be a research focus in order to gain from the possible benefits. Some of the benefits on a societal level can be foreseen, such as using new technologies, even a promising increase in voting participation or citizen engagement, meaning more direct decision making (Manville and Ober, 2019). On the other hand, the challenges of big data on manageability concern still is a debate (Stevens and Wernimont, 2018)

Integration of Health 4.0

Given the general information of Health 4.0 challenges as above, the integration framework is very much on a similar topic. Basically, to overcome the obstacles turning to opportunities and gain benefits embedded in working by segmenting (e.g., system approach). It is not the authors' aim to make a strategic plan or form a strategy for integration; however, by doing so, the main logic of the Health 4.0 concept can be framed to help to ensure the urgency at first glance and sustainability later.

Technology has made many efforts in the past decade through all industrial revolutions that enlighten AI, robotics, IoT, automation, computing, information systems, etc. As technology is a unique specialization, integration should be done via politics, the legal system, and a cultural basis. Knowing that this is not easy to apply in other segments and levels, taking baby steps could be a strategy. Although the change in manufacturing fact of Industry 4.0 is changing rapidly, Health 4.0 is in the early stages; therefore, it should be very well designed and put forth. Health 4.0 depends on the issues at the societal level, governance, and legal issues needed to be solved. Today, the number of the aging population on one side and the increasing number of mobile device users (internet) on the other, are forcing governments to act on the advantages considering Healthcare's expanding cost. Besides, the exchange of data and data security concerns people, sectors, and society. Hence, the boundaries are to be identified, and requirements of legal settlements propounded affecting from macro to micro-levels. As those levels are interdependent, they can be concluded as technical, legal, and political.

Education is another dimension combining all levels of interest. Universities and institutions could be the accelerator of forming frames, accessing, implementing the process of the revolutions. With the help of the knowledge gathered from academic research, the development of strategy and design process of Health 4.0 can be enabled. The produced information needs to be shaped by how, when, and to whom uses it effectively Healthcare has also become one of the pioneer programs in many aging countries as it can account for the necessity of this era. To give an example; in Turkey, a recent doctoral scholarship has been announced covering the programs of eldercare, elderliness, and geriatrics (Higher Education Council

of Turkey, 2019). By doing this, the awareness of the reality of healthcare under the Health 4.0 lenses will be clarified by qualified staff. However, we also know that education must be multifaceted, such as staff, practitioners, academics, patients, and society at a wider level. In sum, Health 4.0 is not a trend but a massive change that we soon are going to face; for this reason, we need to push the awareness levels as high as we can regarding the resistance that always comes with change.

This article aims to reveal two points: a- to clarify the concept and why it should be adopted as a philosophy and b- to review the drivers and challenges of Health 4.0 by identifying the status quo of the concept in Turkey. Further, the authors' aim is also to reveal the embedded meaning Health 4.0 and to envision the future research direction.

Methodology

Methods Study 1

The purpose of Study 1 is to assess RQ1 and the roots for RQ2 above via IoT stand examples via two written vignettes, which intrinsically aims to reveal the embedded awareness of the concept. This work seeks to address the aforementioned concept and to assess the dependent variable awareness of Health 4.0, via constructed scenarios. Employing the Vignette m ethodology is chosen as an effective method for measuring events on an individual's perceptions. Vignettes enhance researchers to reach the intentions, attitudes, and behaviors; in this case, awareness of the Health 4.0, can be explored through participants' responses (Atzmüller and Steiner, 2010).

In the natural setting of this work, a mixed model qualitative research design has been chosen. The data gathered from Vignette 1, fundamentally had the roots for Vignette 2. In terms of the vignette methodology, both scenarios may refer to policy conducting type. Depending on a priori knowledge, the authors would like to have a clear understanding of the factors and their level of importance in terms of creating a societal engagement framework. If one can reveal the observed effects, eventually, work as a sequence in the decision-making process, reminding that qualitative philosophy's main aim is not to reach fully generalizable results (Taylor, 2005) (Hughes and Huby, 2002).

Participants and Procedures

The sample of this work is six participants. Although the number of participants is adequate for this form of work, it can be maximized for further analyses. Given the notion of "the quality of the data obtained is dependent upon the respondent" (Cavanaugh and Fritzsche, 1985), authors have gathered the data from the sampling that match this study's purpose. For

instance, our sample consists of 3 academics, two doctors, and one bank manager who all have senior parents (min. +65 aged) and personally immersed with the given scenarios.

Furthermore, to overcome validity issues, we paid attention to the below recommendations from vignette literature:

- the participants chosen for the study are familiar with the situation presented; otherwise, responses may be artificial (Aiman-Smith, Scullen, and Barr, 2002),

- they are willing to provide information,

- "Actual derived cases" or "more lifelike scenarios" to provide details to reach realistic factor levels (Shepherd and Zacharakis, 1999).

Following the information given for the scenario, participants were allowed to express themselves, reflecting their intentions and feelings evaluating the real-life situation via in-depth interviews all lasting one session, an average of 30 mins. The data gathered from participants are coded and defined as drivers and challenges. The segmentation of challenges can be addressed as technological, legal, societal, security (Study 2).

Material and Measure

To be able to understand the main dimensions of the Health 4.0 ecosystem and the most important factor for the respondents to design a new health revolution engagement in realistic conditions, two vignettes were intended for providing general information about what is to be done in the future. Materials are in the Appendix.

Results

According to the majority of the participants (4 of 6), the system is approachable due to the global technology level. However, the awareness of the aging population and forecasting the possible precautions revealed by the participants cannot be generalized to the population of Turkey. Some critical statements regarding RQ1 as following:

P1 (Male-MD): "…I believe that this can be done with education. We have patients who cannot even express what is wrong with them… because they are living with their children who are taking care of them. Sometimes the treatment is not solely the patient's decision, but their children's'. It is so cultural as something must change in the culture…"

P3 (Female- Academician): "…when I read the scenario, I said to myself as I have seen it before...many times, in series or movies, particularly. I really wish to have this system in Turkey as I have pretty much the same concerns. When you get older, it feels like everyone around you is falling apart as thinking about how much bad news (esp. cancer) I have heard

in the last five years… I also think that's why everything matters after it becomes a crisis..."

Methods Study 2

To clarify RQ2 and to consider how the Health 4.0 concept is embedded with many criteria, the authors decided to examine the qualitative data gathered from Study 1 to form knowledge of the context of this work. Hence, the decision-making process that has occurred in Health 4.0 is complex and challenging, the core context being usual human activity that helps to make decisions based on choosing, ranking or sorting alternatives (Zhang, Ju, and Liu, 2017). The decision-making procedure involves finding the best alternative, choice, option, action, or ranking of the alternatives when there are many (Kuo, 2017). Given the information above, the decision making process is chosen in this work to provide decision support through the development of the knowledge of the context Health 4.0 and to excavate the embedded knowledge to be able to establish a new area of expertise- the Health 4.0. While researching real-world applications of multicriteria decision making/aid works, MACBETH (Measuring Attractiveness by a Category-Based Evaluation Technique) method which has formerly applied, aiming at relaunching socio-economic development inside of a European Commission (MEANS- Hainaut case), was precisely chosen for this work (Bana E Costa and Vansnick, 1997; Bana E Costa et al., 1999).

Procedure

By using MACBETH, the strengths and weaknesses of the novel concept via individual-specific judgments to institutional and societal levels achieves a strong profile in terms of any potential engagement process. In doing so, analyzing in a multicriteria method, results would help to recheck and undermine the current debates around the Health 4.0 concept, helping to form many applicability levels in the future.

Based on the data gathered from the in-depth interviews of the first scenario, we would be able to underline repeatedly given statements on similar issues which would enable us to segment main criteria such as confidentiality issues, security issues, legal level issues, societal issues, manageability issues.

Material and Measure

The MACBETH method was developed in the 1990s by C. A. Bana e Costa, J. C. Vansnick, and J. M. De Corte. The method has emerged with the aim of creating a quantitative decision-making technique based on the qualitative judgments of decision-makers. The question in the minds of the researchers who developed the method was how to put forward a scale that would indicate the preference levels of decision-makers among options without forcing them to indicate the preferences with numbers. Thus, the MACBETH method, based

on semantic judgments such as “weak”, “strong”, emerged in binary comparisons (Yıldırım and Önder, 2015). The first software for the method was developed in 1997 by J.M. De Corte (Kundakçı, 2016).

The MACBETH method is different from other MCDM methods while making comparisons based on qualitative values instead of quantitative values. This approach requires discretionary information for binary comparisons. Paired comparisons of criteria based on qualitative values. The relative weights of the criteria can also be determined. While the qualitative information determined by the decision-maker is entered into the M-MACBETH program, the software system makes a verification of the consistency of the qualitative evaluations entered and offers proposals to resolve them if there are inconsistencies between the entered qualitative values (Ercan and Kundakçı, 2017). MACBETH has similarities with techniques such as AHP from the user perspective. Both methods are based on the results of binary comparisons. However, the AHP method uses ratio-scale while MACBETH method uses interval-scale (Yıldırım and Önder, 2015; Cevizci and Kayacan, 2019).

Decision-makers make decisions, about the difference in attractiveness between two stimuli that have seven categories, one by one on the semantic scale. It is desirable that these are extreme (extremely strong), very strong, moderate, weak, very weak, strong, and no, arranged in descending order of importance. The meanings of these seven semantic scales are as in Table 3. Performance metrics are generally qualitative judgments that are proportionally quantified on a 0-100 scale. Criterion weights can be determined by applying the MACBETH method, which is based on the binary comparison query mode. It helps decision-makers to rank alternatives based on the overall measure of the relatively weighted attractiveness of alternatives according to various decision criteria (Karande and Chakraborty, 2014).

Table 3
Semantic scale of MACBETH

Semantic Scale	Equivalent Numerical Scale	Significance
Null	0	Indifference between alternatives
Very Weak	1	An alternative is very weakly attractive over another
Weak	2	An alternative is weakly attractive over another
Moderate	3	An alternative is moderately attractive over another
Strong	4	An alternative is strongly attractive over another
Very Strong	5	An alternative is very strongly attractive over another
Extreme	6	An alternative is extremely attractive over another

If the comparison using seven semantic scales is unreasonable, the decision-maker has the freedom to select more than one ordered category. Decisions provided by the decision-maker are checked for consistency. If the judgments presented are found to be inconsistent, the M-MACBETH software proposes changes to make the decisions consistent. Consistent decisions are then translated into proportional quantitative scales. For the conversion of ordered scales into quantitative MACBETH scores, a mathematical operation is done (Kabalak et al., 2014).

The steps to be followed while solving the problems with the MACBETH method can be summarized are as follows:

Step 1: Criteria are determined and shown in the value tree structure.

Step 2: After creating the value tree, alternatives are determined. Then, the possible performance of alternatives based on a specific criterion. The sequential performance levels showing are defined. Minimum two reference levels, upper reference (good) level, and lower reference (neutral) level need to be defined. On the MACBETH scale, the upper reference level gets 100 points, while the lower reference level gets 0 points. Here, 100 does not represent the best possible score, and 0 does not mean the worst performance of the alternative for a given criterion.

Step 3: The (m x m) dimensional matrix is created for the alternatives. m shows the number of alternatives to be evaluated based on the specified criteria. Within the matrix, alternatives are ordered from left to right according to their importance. This is done to measure qualitative performance levels and to convert quantitative performance levels into the MACBETH scale. The same procedure is applied for the criteria.

Step 4: Paired comparisons are made for criteria and alternatives. In the MACBETH method, the seven-category scale shown in Table 3 is used for evaluations.

Step 5: The consistency of the judgments made by the decision-maker is checked. If the judgments given are found to be inconsistent, the M-MACBETH software indicates possible changes that need to be made.

Step 6: Consistent judgments expressed according to the MACBETH scale are converted into an appropriate numerical scale using linear programming models, and scores regarding the preferability of alternatives are obtained.

Step 7: Finally, obtained alternative scores are added up by multiplying them by the criterion weights. Thus, the overall scores of the alternatives are calculated. According to the general scores obtained, the alternatives are ranked in descending order (Ercan and Kundakcı, 2017).

Results

Through the given procedure, the main criteria are set into four segments, with 11 common statements gathered from Study 1. Criteria of this study are examined by forming a value tree as can be seen in figure 2 below:

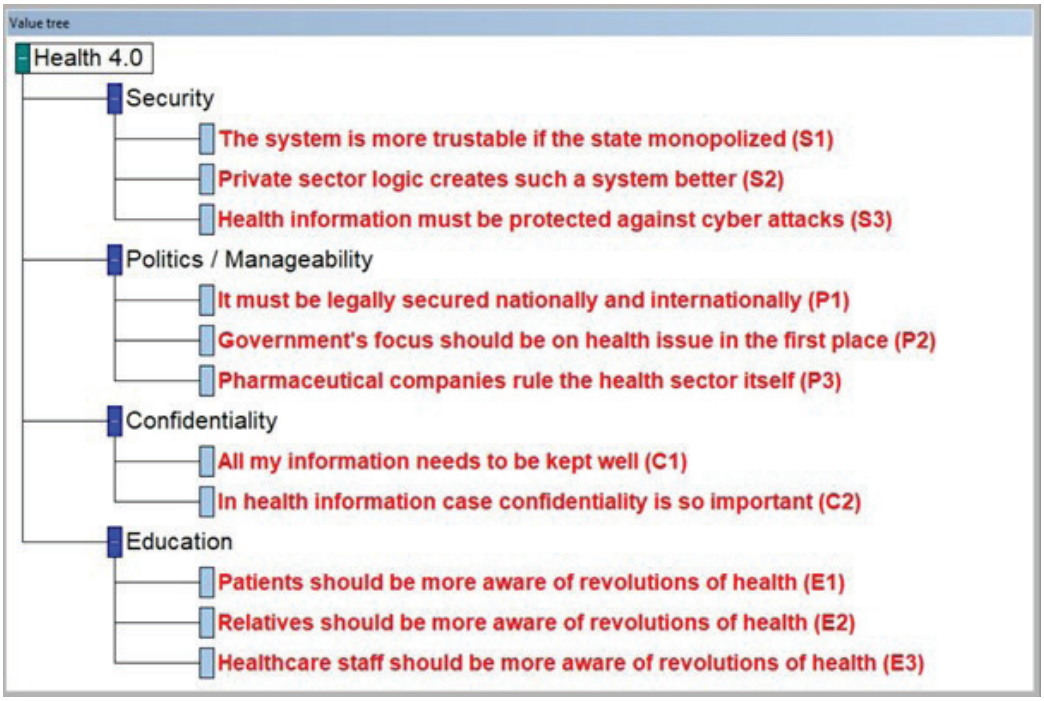

Figure 2. Value tree of the study

As seen from the chart above, after segmented under four main and 11 criteria have been examined in MACBETH by pairwise comparison. The matrix form of criteria weighting is as below in figure 3.

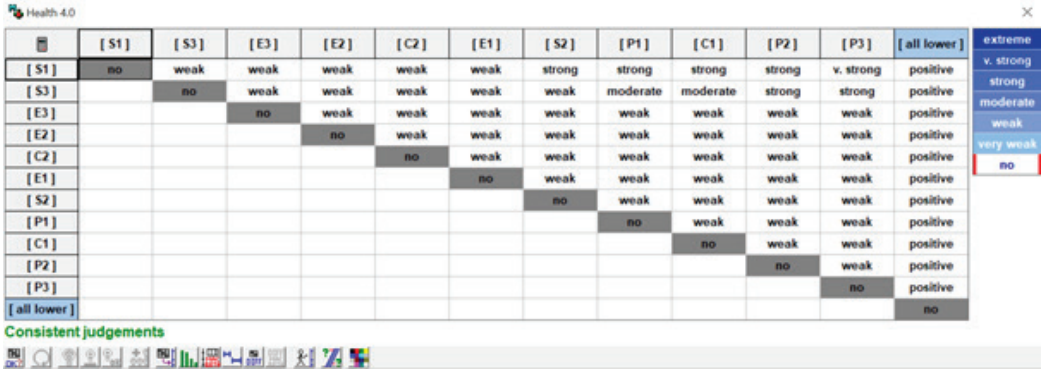

Figure 3. Criteria Weights Matrix

All linguistic criteria have been assessed quantitatively, and all judgments are found consistent. As can be seen, all the comparisons in Fig. 3 above, one can compare one single

judgment to all the others in pairwise by weighting as extreme, very strong, strong, moderate, weak, very weak, and none. The criteria weights of MACBETH can be seen in Fig. 4.

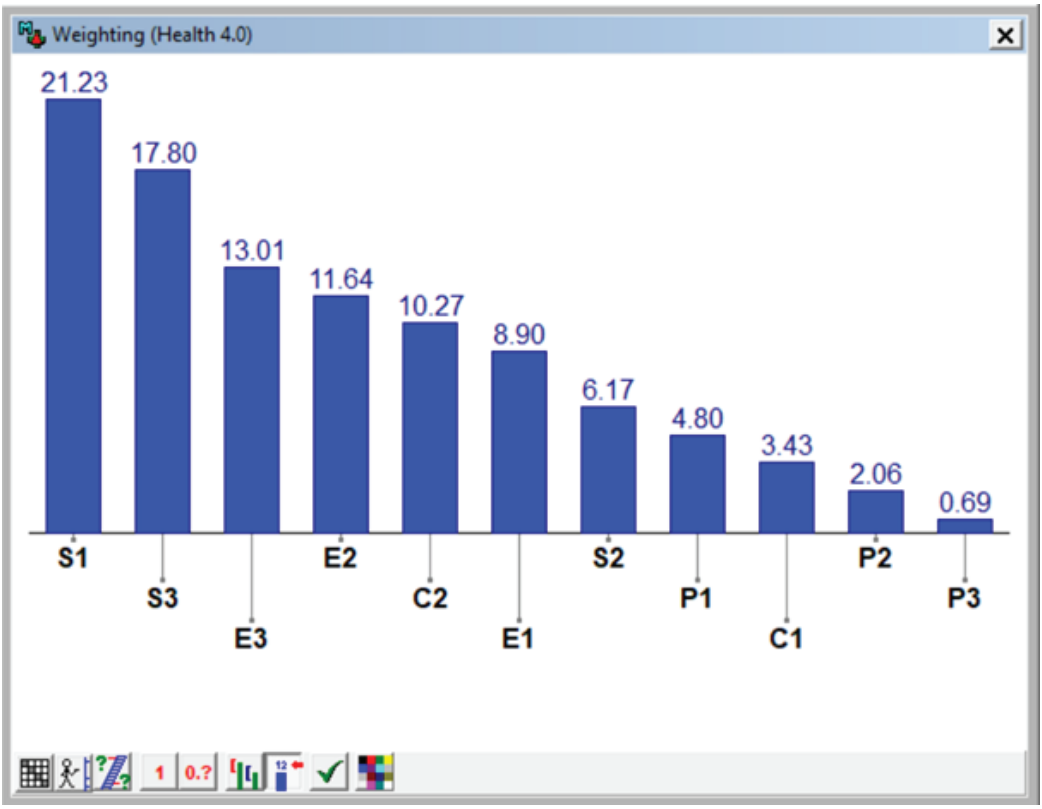

Figure 4. Criteria Weights

As shown in Fig.4 above, the most important criterion is S1 (%21), while P3 is the least important (%0.73). Security segmented criteria such as S1 and S3 are the prioritized challenges of Health 4.0 for the respondents of this study in the context of Turkey.

Discussion

Among the 11 challenges reported in Turkey, the most important criteria can be headed under security, which is also supporting the idea that Industry 4.0 is currently pertinent to the Health 4.0 concept. Prospectively, the security of health data and protection by the state-owned sector (S1 and S3) were in the top three. However, although the politics/manageability criteria were the least important, one should remember that the top-ranking criteria are required not only technical but also legal and managerial aspects. Besides, remembering that study 2 is a group decision, the ranking might not be predictable, according to the literature above.

In this study, security, education, confidentiality, and the politics/managerial main criteria are ranked among each other. According to the results, the government has the primary responsibility in terms of regulating and managing the health system, the security of health data, and the education of healthcare providers in Turkey. These results may also be underestimated due to the current conditions of health, as the Ministry of Health is the primary regulator working with related agencies of the Ministry of Family and Social Policies. Citizens are protected by the Social Security Institution, the main body to regulate, monitor, and control is responsible for many topics from health insurance, pharmaceuticals to quality of care. Hence, any exchange done will be under the government umbrella. Observations showed that the awareness of this Health 4.0 is also expected to be included in national policies. Participants' decisions were referred to and it was stated that even awareness training was reasonably predictable with public systems. This result is contradictory to decentralization needs, as mentioned in the literature (Thuemmler and Bai, 2017). As a matter of fact, regarding cultural norms and value issues, the government is still seen as the main body of any change in Turkey. Here an interesting question comes into mind to examine in further studies, whether being the main body in health will still work in terms of personalized and precise healthcare or not. Although the paradigm is shifting to decentralization, the more the government has a hands-on approach, the more people trust in security problems.

An exciting result in terms of education; people see healthcare providers need more qualifications in health issues (E3) rather than relatives or themselves (E2). This finding stresses that qualification and training are necessary. One side of this tendency is educationally based (universities and institutions), while the other is 'a seeking vision'. This vision is societal. Creating or building a system and knowledge in furtherance, tralatitiously can be defined as hardware and software.

Conclusion

This study contributes to Health 4.0, its awareness, and the criteria involved in understanding and managing new health logic in many ways. As Health 4.0 being a new concept, the body of knowledge and state-of-art is still incipient. With our findings, the concept itself, and its implementation, the challenges are enlightened in terms of adoption. Aligned with the holistic view, the authors revealed that the challenges are agglomerated at the societal level. As the awareness is increasing in individuals, the findings support that there are concerns about the security that occurred by digitalization as in many areas. Moreover, confidentiality impairs the security concerns; and the government is seen as the regulatory and supervisory body. In opposition, when integrating Health 4.0, the governments' role ranks as the least important while intriguingly, the data is a trust issue of the government in the first place.

Besides, as a hybrid approach, the qualitative and quantitative analyses were done as the findings from the qualitative analysis exposed the data to be used in quantitative analysis.

This methodology helped us to see the cultural philosophy on multiple levels (individual/institutional/societal) conjointly to see the contextual characteristics of the nation in order to be able to take assertive actions.

The used methodology has some practical contributions, providing practitioners, managers, decision-makers, and leaders with some evidence that embraces the change by revealing the state-of-art and practical use of MACBETH method.

With more decision-making models, behavioral assessments will help to gain knowledge for government and practitioners in multi-disciplinary convergence. Overcoming the challenges to obtaining benefits are in the locus of academia and industrial studies and integration of all levels to engage any kind of revolution for society. In conclusion, by framing the main logic of Health 4.0 to ensure the urgency at first glance, this study would be another brick in the wall of change.

Limitations and Recommendations For Further Studies

Regarding the limitations, the participants were aware of the current security and the confidentiality debates about the concept as discussed in the literature. This presupposition might have reflected the weights of the judgments in the MACBETH approach. For this reason, the discussion of challenges revealed in this study cannot be generalized. Second, the participants' awareness of Health 4.0 is without experience, yet this is a real limitation as the decision-making process is under bounded vision.

As the integration challenges are examined in this study, the economic and socio-economic constraints were not subjected. For further studies, in terms of emerging country sampling, measuring the economic data of the resources that are being used in integration would add some insights.

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APPENDIX

Definition V1: Imagine that you have concerns about your 77-year-old mother, who lives alone outside the city. If she falls at home and her phone isn't there, how will she call you or her neighbor or 112* and ask for help? To prevent a situation given, a device was made with the size of a car key and with a button easily pressed (hence can be hung lengthwise like a necklace). It could also measure movement and, at the same time, understand the fall. In case of danger (sensation of fainting, falling, injury, etc.) when the person presses the button, the staff of the insurance company OR 112 is immediately contacted and the ambulance comes to rescue your mother as soon as possible ...

This device also applies to the sensation of blood pressure, body temperature, or heart rhythm.

Definition V2: Your father, who had to live alone after losing your mother, has a sleep apnea problem. When you first get up in the morning, as because you can't be there for reasons such as living in a different city and your work intensity, your first job is to call and check on him. This is both an indication of your helplessness and means that you live with constant anxiety in your brain through your daily routine. One day a friend speaks of a system, a system established for the elderly and those with health problems. A system that changes according to the distress of the individual but makes measurements with wearable devices and gives direct information to the home-hospital or home-rehabilitation center or home-health centers when a specific limit is exceeded ... A system is taking the signal from the individual and making an evaluation spontaneously, warning even the individual interferes in situations of danger, progressing as soon as possible ...

You told your friend: "I couldn't get any good news from you today, and you immediately contacted the company/ies to join the system.

*Version of 911 in Turkey.

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RESEARCH ARTICLE

Consumptionscape of Turkish Feminist Mothers: Negotiations between Motherhood, Consumer Culture and Feminist Ideologies

Miray Baybars[1], **Ayla Özhan-Dedeoğlu**[2]

Abstract

The present study analyzes consumption practices of feminist mothers and how they negotiate tensions arising from the clash of their multiple identities and marketplace behaviors. Having a broad research focus, this study aims to contribute to the epistemic terrain of motherhood and consumption and provide new theoretical explanations by revealing the extent of negotiations at the crossing axes of consumer, feminist and mother roles. The findings reveal that feminist mothers negotiate different cognitions, practices and narratives of identity, and develop a practical logic based on the interplay between authentic and mass-produced, natural and artificial, branded and generic, traditional and modern, industrial and rural, over-consumption and needs-satisfaction without necessarily privileging one over the other. The present study fills a theoretical gap by revealing how their practices incorporate a polysemous quality based on their intertwined roles and discourses.

Keywords

Feminist Mothers, Motherhood, Consumption, Negotiations

Introduction

In consumer society, the marketplace has become a preeminent source of mythic and symbolic resources through which people construct practices and narratives of identity, and communicate meanings in particular social roles and relationships (Arnould and Thompson, 2005). Mothering practices and motherhood identities are evidently constructed and communicated through consumption in the marketplace. The domain of knowledge of modern motherhood, and its rules of action and modes of relation to oneself are largely structured around consumer culture. Women, as constituent subjects and reflexive consumer agents, construct motherhood through authenticating acts and communicate and negotiate it in the community through authoritative performances (Arnould and Price, 2000). Despite the em-

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powerment through meaning-making activities and the agency consumers have, the structure of the consumer society and mass-marketed consumption ideologies are perceived by feminist literature as a compromise to women's independence; they objectify and oppress women as females, wives and mothers at the psychological, economic, and socio-cultural levels (Gimenez, 2005). To gain comprehensive insight into the individual experience of mothers, as Foucault (1997) asserted, instead of the constituent subject per se, there is a need for an analysis that accounts for the constitution of the subject within a historical framework and comprises domains of knowledge, types of normativity (e.g. rules that differentiate good mothering from bad), and modes of relation to oneself and others. Feminist ideologies problematize motherhood as another venue of modern patriarchy for male dominance, proletarianization and confinement of women to the private sphere (Steiner and Lachover, 2016; Click, 2009; Sancar, 2012; Fraser, 2013). The discussions on motherhood are largely centered on the 'good mothering' ideology that rests on the power relations and ideology of the traditional patriarchal family and sets of norms for mothers (Kinser, 2010; Dedeoglu, 2006).

Despite rich feminist literature on motherhood and gender, inequality, domination, family relations and other dimensions, there remains a need for research (Cook, 2013; Hollows, 2013; McRobbie, Strutt and Bandinelli, 2019) on how feminist mothers interpret mass-media marketplace ideologies. Previous studies mostly investigated the problematic relationship between consumption and feminism using texts that appeared in mass media. Some studies illustrated tensions between feminist mothers and children that arise during shopping (e.g. Miller, 1997), but tensions between the mother and third parties with regard to consumption practices have not been addressed. The present study addresses the following broad research topic: how feminist mothers construct and negotiate life themes and narratives of identity using market-generated mythic and symbolic resources in relation to other people, such as other family members, within the socio-historical context interwoven with relations of power and dominance. An interrogation of feminist mothers' consumption practices that come into play in the problematic juncture between feminism, motherhood, and consumption requires an acknowledgment of the intersections of woman, feminist, mother and consumer identities. Since women's oppression may stem from multiple subordinations, as they sit at the crossing axes of many categories, intersectionality studies have analyzed intersections of many divisions, such as gender, sexual orientation, ethnicity and class (Crenshaw, 1991; Yuval-Davis, 2006; Shields, 2008). O'Reilly (2016) argued that maternity needs to be likewise understood in terms of intersectional theory because the motherhood and womanhood identities are distinct from each other. An analysis of feminist mothers' consumption practices may benefit from recognition of mutually constitutive relations among these identities (Green 2019).

Scholarly studies on Turkish modernity (Gole, 2003; Kandiyoti, 2002; Sandikci and Ger, 2002) reveal that Turkey provides a unique case that rests on local interpretations of modernity and patterns of difference, hybridization between local and global, traditional and modern. Despite the gains of the state-induced modernism project and feminist movement

after the establishment of the Turkish Republic and the subsequent second-wave feminist movement, conservative changes in Turkey's political landscape in the 21st century have compelled feminist literature to focus back on women's basic rights instead of less pressing issues, such as motherhood (Arat, 1998; Koray, 2011; Diner and Toktas, 2010; Sirman, 1989; Negrón-Gonzales, 2016; Durakbasa, 2019). The following phenomenological analysis of consumption practices of feminist mothers illuminates how they attempt to shape their children's subjectivity as future consumers and negotiate the tensions arising from the clash of their multiple identities and marketplace behaviors. Since the study also focuses not only on mother and child relations, but also on relations between mother and other people in the non-western context of the Turkish marketplace, the findings may contribute to the epistemic terrain of consumption and motherhood via development of a new theoretical insights by shedding a light on the tensions and negotiations.

Motherhood in the Context of Consumer Culture

Foucault (1978a) emphasized that in a modern society different forms of power, as a function of knowledge, are exercised through disciplinary means in a variety of institutions. In consumer society, consumption has largely become a symbolic rather than an instrumental activity that also constitutes a structure of domination. Consumer culture is organized around the principle of obeisance to the different market actors' cultural authority: people who have internalized its values implicitly grant firms the authority to organize their tastes (Holt, 2002). Arnould and Thompson (2005) argued that 'consumer culture and its marketplace ideology frames consumers' horizons of conceivable action, feeling and thought, making certain patterns of behavior and sense-making interpretations more likely than others'. Dobscha (1998) revealed how the marketplace did not act as a place in which mutual exchange is facilitated but rather a place where waste and false claims run rampant. Consumers' free will can be seen as an illusion since consumers are not emancipated from a network of relations that are based on power (Slater, 1997).

Nevertheless, contemporary consumer society cannot be explained with passive individuals vis-à-vis the market; on the contrary, consumers are active agents who construct identity and create a unity between themselves and community through authenticating acts and authoritative performances (Arnould and Price, 2000). Firat and Dholakia (2016) remarked that the human subject has traveled far from the traditional subjectivity of the "being subject" to the "knowing subject" of modernity, which has been especially represented by "the citizen" in early modernity and then "the consumer" in late modernity. Although an individual is a reflexive subject who has agency in constructing the structure, s/he is also constituted by the discourses and practices in which s/he is embedded (Firat and Venkatesh, 1995).

Foucault (1978a) noted that 'resistance is an integral part of power relations. Despite obedience to the market power, consumers, through meaning-creating activities, reflexively interpret and transform mass-produced meanings to make collective sense of their environments, construct individual and collective identities, and even appropriate marketing institutions and agents, and resist against the consumer culture in diverse ways (Kozinets, 2001).

Since mother and child mutually constitute each other, a mother's empowering agency in constructing her identity as well as the identity of her child also refers to confining responsibilities due to the presence, dependence and needs of the other (Andersen, Sørensen and Kjaer, 2007; Chapman and Gubi, 2019). Therefore, a mother's quest for complete personal autonomy and independence from the patriarchal social structure and imposed power relationships is multi-faceted and complex.

In consumer culture, motherhood is experienced in the sphere of consumption of market-made commodities, symbols or information (Thomsen and Sørensen, 2006; Theodorou and Spyrou, 2013). It is the marketplace that structures the good mothering ideology that dictates child-centered, expert-guided, and labor-intensive child-rearing practice that necessitates a similar workload of a full-time job (Hays, 1996). Defining the symbolic boundaries, the marketplace also offers emancipatory opportunities for subjectivity. Mothers, as full-fledged consumers, are interpretive agents whose meaning-creating activities range from those that embrace the dominant representations of consumer identity to those that do not resonate with these ideological instructions (Arnould and Thompson, 2005). Symbolic consumption facilitates the transition to the role of motherhood and contributes to the development of new identities by reducing perceptions of role uncertainty and incongruity between the actual and the ideal self (Moisio, Arnould and Price, 2004; Bahl and Milne, 2010; Andersen, Sørensen and Kjaer, 2007; Hogg, Maclaran and Curasi, 2003; Layne, 2000).

According to Thompson (1996), 'caring consumption' helps mothers to create more ideal family settings, juggle schedules, adapt to unplanned occurrences, overcome time constraints and develop positive feelings of accomplishment and control. Andersen, Sørensen and Kjaer (2007) illustrated that baby clothing is an important category of expressing the mothers' identity and their motherhood ideals. Budds et al. (2017) revealed that mothers are able to construct identity positions such as committed facilitator, creative provider and careful/caring monitor.

Yet, consumption may also complicate the transition to motherhood because of insufficient resources and uncertainty felt due to lack of consumption skills and unawareness of product-related meanings (Voice Group, 2010a) . Moreover, they may not relate to the marketplace ideologies and/or resist commercialized mothering experiences. The marketplace takes up and amplifies the domain of knowledge and types of normativity of motherhood and ties them to consumption, constructs possible identity roles mothers can live up to and

excludes alternative maternal subjectivities (Voice Group, 2010b) . Banister, Hogg and Dixon (2010) argued that to define their own version of the ideal self, mothers either resist the discourses, reconcile the discourses or disengage from the discourses.

Consumer culture context is vital on how mothers construct and negotiate life themes and narratives of identity not only via commodities or symbols within, but also the power relationships within this context that are effective on these relationships. Understanding motherhood experiences and the identity negotiations will be incomplete with an investigation excluding consumerism and consumer culture. Therefore, feminist mothers' mothering experiences need to be examined through a lens with a consumer culture focus.

Feminism, Motherhood and Consumption

Feminist theory questions the social construction of gender and male-dominated power structures in modern capitalist societies, demands socio-political identification, socio-cultural recognition, and embraces individualism and intersectionality (Kristeva, 1981; Sancar, 2009). With a focus on economic independence and equal rights, Hollows (2013) suggest that many first-wave feminists in the late nineteenth and early twentieth-centuries used domestic consumption practices as a resource for intervening in political struggles in the public sphere. Consumption was seen as a safe area for women, who were confined to their house, so that they could become a part of the public sphere while shopping. Kleinberg (1999) noted that affluent women used the maternal platform as one basis for social activism, improved education, and political integration. Second-wave feminism broadened its focus to difference, identity and gender hierarchy and further scrutinized the role of the family and maternal thought in political philosophy (Anderson, 2001). They rejected patriarchal systems of power and pointed to capitalism's power to construct 'false needs', and to manipulate individuals into social conformity and subordination (Martens, 2009; Nava, 1987). The beauty and fashion industries were seen as contributing to 'symbolic annihilation' and objectification of women (Fenton, 2001). Third- wave feminism embraced post-structuralist interpretations of gender and argued for relativity, and the multiplicity of every person's possible identifications (Kristeva, 1986) and intersectionality. Post-feminism advocates for more personal and daily gender-based struggles and argues that, within a consumer culture context, consumption is a tool to achieve power and pleasure, as an alternative route for self-esteem. Through consumption, women construct their identity, and challenge, negotiate and critically engage with the ways in which capitalist consumer culture was organized (Adriaens and Bauwel, 2014). Nava (1987) argued that consumerism is a discourse through which disciplinary power is both exercised and contested. Hollows (2013) pointed to the potential of a feminist politics of consumption to challenge the ways in which consumer culture operates.

O'Reilly (2016) contended that mothers are the unfinished business and the unspeakable of feminism, the 'problem with no acceptable name'. Ideologies surrounding motherhood can complicate the construction and negotiation of women's individual subjectivities, especially when motherhood is conflated with gender essentialism. Since exclusive female mothering that originates from the gender essentialism of modern motherhood is contested in feminist literature, a clash between feminist and mother identity narratives can be expected.

Mothering practices of feminist mothers in the context of consumer culture has not been sufficiently addressed. Since 'caring consumption' (Thompson, 1996) is a site where patriarchal capitalist ideology is inscribed, it can be suggested that feminist mothers' relationship with consumption may differ from that of other mothers . Miller (2005) revealed that materialism can be perceived as a major pollutant for children even by mothers who may not see marketing as necessarily evil, and mother and child relations are redolent with contradictions due to the clash of their individual agencies. Although consumption can help women during transitions into motherhood, it can also make transitions complicated and complex (The Voice Group, 2010a). Phadke (2013) argued that for feminist mothers, the dilemma lies in their own discomfort both with this limited and limiting notion of consumer agency as well as with the ways in which the marketplace sexualizes and objectifies their daughters. Another dilemma stems from mothers' consumption by proxy, specifically in the name of children who can pursue agentic goals, putting mothers in a position of dominance and power, which feminism rejects from the start.

Considering the limited literature related to motherhood and feminism in consumer culture, it can be stated that there are important points that this study will illuminate on the basis of feminist motherhood by focusing on consumption, which is one of the important focuses of motherhood.

The Study

Although there are studies that focus on the resistance of feminist women against dominant beauty ideals, there is insufficient interest in consumption in feminist literature, despite consumption practices' potential transformative power on suppressive operations of consumer culture (Cook, 2013; Hollows, 2013). By studying consumption practices of feminist mothers, this study aims to offer new theoretical explanations about how they construct and negotiate their identity narratives in the marketplace by using consumption-related material and symbolic resources, and how they cope with tensions that emerge in the problematic juncture between feminism, motherhood, and consumption. The study also aims to provide insights into tensions feminist mothers experience in Turkey, a patriarchal and Muslim country. The western-oriented modernism project of the early Turkish Republic had a transformative impact on the private and public spheres, on gender relations, and identities (Gole, 1996). The

project embraced gendered identities where women were identified as agents of modernization and western civilization, patriotic citizens with civil rights and corporeal visibility in the public sphere, and mothers that would cultivate the new generations (e.g. Kandiyoti, 1991; Durakbasa and Ilyasoglu, 2001). Despite the gains of state-induced modernization reforms on women's emancipation during the 20th century, women's studies only became a field of study after 1990, and the feminist movement could not flourish due to the lack of a separate discourse independent of the ideological contexts of secularism, religious conservatism and other socio-cultural factors (Durakbasa, 2000; Tekeli, 1992; Kandiyoti, 1987).

Scholarly studies have revealed Turkey's unique character, that embraces distinct patterns of modernity and rests on socio-historical continuities and discontinuities. Turkish context is characterized with cultural fragments, varieties in mentalities, lifestyles, identities and consumption behaviors and the hybridizations between the traditional and the modern (Kandiyoti, 2002; Sandikci and Ger, 2002). In the early 21st century, Turkey has undergone several socio-cultural changes in terms of people's attitudes toward the organization of the public and private sphere, and ethnic and religious conservatism has resulted in a certain dividedness between people. Considering the past and present representations of motherhood and consumption in the marketplace, and particularly in mass media that strengthen patriarchal ideology, it can be proposed that potential tensions, and thus, negotiations are salient and worth further investigation.

Methodology

For the aim of the study, a phenomenological perspective was adopted to develop an in-depth and rich understanding regarding the essence of experience (Finlay, 2009: 6; Creswell, 2016: 105). As phenomenology is inclusive of all types of qualitative research and is concerned with the meaning, rather than the experience itself (Merriam, 2013: 24), this method is considered to be a very suitable technique to have a deep understanding of the phenomenon of "feminist motherhood consumption".

Data was collected through in-depth interviews. For a preliminary discovery of the participants' main concerns, six mothers were interviewed in 2013. After these initial meetings, to meet women who define themselves as feminists and have child(ren), the lead author attended ten meetings of a feminist organization, so that she could reach participants and gain a deeper understanding about feminism. In these meetings, she met women, so she determined the first feminist mothers to interview, and reached other women with their help. Snowball sampling was used to reach participants living in different cities. Interviews were mostly held in public places like restaurants, cafes and parks. Four of the interviews were held in participants' offices, and one was held online due to the interviewee's remote location. The questions were prepared depending on categories obtained from the relevant literature. The shortest

interview took about 90 minutes -with F. C., due to her urge to leave the meeting-, whereas the longest interview took about three and a half hours. A computer program was used for data analysis and coding. During the coding phase, the researchers worked together, thereby trying to establish a consensus.

Informants were diverse in terms of age, geographical location, religious orientation and length of motherhood experience. It is aimed to make it possible to understand the consumption practices of feminist mothers who have different lifestyles and worldviews. Some participants' relatively short motherhood experiences and thus, differences in terms of respondents' ages are thought to add richness to the data since they increase diversity, despite offering some limitations.

The demographic profile of the participants appears in Table 1. Feminist mothers were interviewed between 2014 and 2016. After interviewing seventeen mothers, data saturation in terms of themes was reached. To validate the accuracy of the findings, a member checking procedure was used; the findings were shared with the participants who agreed to be contacted for any additional comments. Credibility and transferability of the study was enhanced by means of referential adequacy and prolonged observation. Interviews were recorded for further audit and confirmation.

Table 1
Demographic Profile of Informants

Informant Initials	Marital Status	Year of Birth	Child(ren)/sex/year of birth	Education-level	Occupation	Residence
A.C.B.	Married	1980	A son (2009)	Bachelor degree	Unemployed	Izmir
B.G.	Married	1956	A son (1990)	Bachelor degree	Retired	Izmir
M.K.	Married	1964	A daughter (2007)	Bachelor degree	Public Officer	Izmir
R.K.	Married	1970	A son (1999)	Bachelor degree	Public Officer	Izmir
J.A.	Married	1970	A daughter (2005)	High school degree	Public Officer	Izmir
S.C.	Single	1963	Two sons (1982-1992)	Bachelor degree	Psychologist	Izmir
M.K.	Married	1976	A son (2013)	Graduate Degree	Public Officer	Izmir
E.D.	Single	1976	A daughter (2002)	Bachelor degree	Teacher	Izmir
B.K.	Married	1979	A daughter (2012)	Graduate Degree	Research Assistant	Ankara
E.H.	Married	1974	A son (2009)	Bachelor degree	Social Anthropologist	Ankara
F.C.	Married	1970	A son (2005)	PhD Degree	Academician	Ankara
M.I.C.	Married	1966	A daughter, A son (2000-2004)	Graduate student	Psychologist	Ankara
G.B.	Married	1969	A daughter (2003)	PhD Degree	Psychological counselor	Ankara
E.E.A.	Married	1970	A daughter, A son (2008-2011)	PhD Degree	Academician	Ankara
R.C.	Married	1986	A son (2015)	Bachelor degree	Translator, musician	Istanbul
T.M.K	Married	1980	A daughter (2015)	Bachelor degree	Teacher	Izmir
G.A.A	Married	1979	A daughter (2015)	Bachelor degree	Financial consultant	Izmir

Findings

Consumption: A major or minor problem?

Our findings indicate that, in general, the participants did not consider capitalism and consumption to be an urgent macro-political problem, despite many consumption-oriented concerns reflected in their individual consumption practices. Notwithstanding feminist critique of consumption as a tool of patriarchal systems of power, for participants, it was not an area that triggered resistance (e.g. Gibson-Graham, 2006).Consumption is regarded as a topic that 'you cannot be completely free from it' and that needs to be 'balanced'. Considering that all participants were representatives of upper-middle class, it can be anticipated that they do not have social class-related concerns. The quotation below demonstrates concerns other than capitalist marketplace ideology, such as basic human rights, violence, and gender inequality are deemed more crucial.

B.G.: Think about the many incidents we've been experiencing since 2013. (She exemplifies women's and human rights incidences). We suffered so much... Just a few people who know what's going on in the country they live in and, despite everything, try to do what needs to be done. We don't have enough time and energy to deal with everything. Other urgencies, other agonies all the time. The miseries of human life come first. [Questioning] Such things may be the product of a free mind. We don't have that luxury.

Further probes revealed that participants consider consumption to be a challenge to the private sphere that may jeopardize their own identity narratives and motherhood discourses. Consumption is perceived as a 'trap', a domination mechanism and a threat towards individual autonomy. Adoption of feminist ideology helped them develop 'awareness' about how experiential marketing activities creeped into aspects of their lives to shape beauty ideals that do not 'belong' to them. They feel a need to decline some of the guilty pleasures of consumer culture for the reason that these are sources of women's oppression in the marketplace.

G.A.A.: Not just about being thrifty, but I have political reservations about consumerism. I don't feel very good about consuming. I feel good when I go to a restaurant and eat, or have a cup of tea while chatting. Spending on nourishment doesn't annoy me, but when it comes to clothes and other things... I don't visit the hairdresser because I get so bored over there. I don't like having my nails done. Pressure on women is somehow done through grooming; you should follow fashion and know the conditions of being well-groomed and beautiful. I don't want to fall into that habit.

Despite their discursive problematizations, consumerist practice is regarded as 'compulsory' and 'inevitable' no matter how much a person is aware of the negative consequences. The quotation below reminds us of Baudrillard's (1998) argument that 'objects are neither flora nor fauna. And yet they do indeed give the impression of a proliferating vegetation, a jungle in which the new wild man of modern times has difficulty recovering the reflexes of civilization.' Despite their critique of consumer society, participants, surrounded by many basic rights violation cases and entrenched consumer culture, cannot use their consumption practices as a form of political activism and oppose capitalism.

B.G.: To stay sterile, especially in today's conditions is impossible; you have to live in seclusion at the top of the mountain. If you don't want to mess with anything, and believe that you must consume the products that suit your point of view, you should make yourself a small garden and consume only your own tomatoes. It's impossible. When S. (a company) fired workers who wanted to be unionized, I stopped buying their brand. More than 1,000 working women died in an accident, I also stopped buying that brand. If I blacklisted all of them, I would live in seclusion. Impossible.

The participants reflexively reproduce and remake what is already made in the continuity of praxis (Giddens, 1984) and reveal consumer resistance in terms of complete denial of mar-

ket offerings; nevertheless, they also refuse to comply with consumer culture to some extent. The quotations below indicate why participants abstain from hospitals' marketing offers for new mothers and events like baby showers: they are criticized for being artificial, for not being authentic Turkish culture but borrowed from the West and practiced in kitsch form. These symbolic meanings are not appropriated in feminist mothers' quests for an authentic identity; on the contrary, they are interpreted as a kind of conspicuous consumption that rests on western discursive (non)representations. Their critique can be interpreted through a postcolonial lens. Even though Turkey was never actually colonized, the modernization project recognized a goal for 'civilization' that is Western and accepted the 'European gaze' as the authoritative standard (Capan and Zarakol, 2017). Ger et al. (1999) remarked that an orientalist imagery of Turkey has been adopted by Turks, resulting in an aspirational identity that has become that of the modern Westerner. The following quotation illustrates how participants comment on emulation of Western consumption practices; they argue that displacing the authentic signs of cultural practices and assigning new, yet 'artificial' consumption-related signs creates a universe that is so empty that it can lead the doer to depression.

M.K.: Baby showers are ridiculous. A consumption frenzy. My nephew's wife threw a party. All artificial... The child is real, everything else is like 'playing house'.

A.Ç.B.: Hospitals offer birth packages; they say we decorate the room, etc... I have a friend. We were pregnant at the same time. She gave birth in a private hospital, she bought them all... She did everything you could think of. Beyond that artificiality, She couldn't not think of the birth's naturalness. She only thought about purchasing things. After birth, she went into depression, because not everything is fun. You are sleep deprived and can't take care of yourself.

The participants evaluate most marketing offers as either deceitful and/or artificial. They elaborate how they are related to consumer culture and cope with such 'traps' by simply avoiding, protesting or finding alternative/informal markets and engaging in non-market transactions (Gibson-Graham, 2006). Corporations, hypermarkets, global brands, industrial food and credit cards are seen as signifiers of 'capitalism, patriarchy, fascism that feed each other'. Simply avoiding these traps appears to be an easy solution that participants prefer on some occasions. However, being aware of the entrenched inevitability of capitalism, they also cope with tensions they feel whenever they are able to develop alternatives. For instance; E.D. explains her political attitude that favors shopping from 'villagers', i.e. farmers, and local shops in the neighborhood. Their avoidance strategies fail when prices in local shops are high or when they need compulsory products like diapers that cannot be provided from alternative outlets. They then develop justification strategies: as long as marketed products are believed to be healthy, natural and/or handcrafted, i.e. not 'sloppy', these products justifiably lose the quality of being traps and become legitimate. To deal with tensions between

entrenched capitalism and their feminist worldview, they develop negotiations and (re)shape their consumption practice (not their ideology, comprehensively) so that it coincides with the post-capitalist feminist view of political economy that calls for emancipation from the hegemony of capitalocentric discourse and liberation of economic difference through 'dislocation—identifying the alternative economic activities, events, and experiences and giving them space to fully exist.' (Gibson-Graham, 2006).

Circumcision, the surgical removal of the foreskin of the penis due to religious beliefs, and the celebration ceremonies of a boy's transition to manhood cause ambivalences. Although most of the participants approve of circumcision for health reasons and choose to comply with the widespread religious and societal traditions of holding celebration ceremonies, they oppose its connotations that signify masculine culture. An unexpected finding is that, although they argue for rites of passages for girls to some extent, most of their concern is not about gender inequality but, notably, about celebrations that represent ostentatious consumption rituals and traditions. The following quotations reveal how they use psychological repair work and justification as coping strategies when they cannot avoid this patriarchal and religious tradition. A.C.B's mentioning of 'dressing up like heroes' points to her criticism of ceremonial dress that symbolizes the state of being superior by emulating Ottoman prince costumes. On the other hand, S.C.'s identification of Western classical music as proper music (along with nostalgic Turkish music) and her despise of Arabic music indicates that aspirational identity of Turkish feminist mothers, as offsprings of the Turkish modernization project, is also that of the modern Westerner. Considering that they also criticize baby showers for being a venue of simple emulation of Western consumer practices that may signify uncritical acceptance of subalternity (Varman, 2018), it is possible to suggest that they develop a practical logic based on the interplay between authentic and borrowed, traditional and modern, the east and the West. Examining A.C.B.'s attitudes toward baby showers and circumcision rituals indicates that circumcision rituals which, indeed, are products of masculinity and constructed socio-culturally over centuries, have been appropriated more than baby showers that are currently practiced in the marketplace.

S.C.: We had a quarrel over it, but I couldn't convince my husband otherwise. If there's no escape, at least it could be close to what I wanted. So, I tried hard to have a nice party. I planned everything. I had to deal with these ridiculous things. I rejected Arabic music and allowed a classical orchestra and nostalgic Turkish music. If I'm spending money, I would like to have proper music played ... I got what I wanted. Circumcision is an Islamic imperative, but I'm an atheist. I knew that it can cause castration trauma. I wanted my son to make his own decision when he grew up. But I quarreled with my husband. Wedding rituals are understandable. But the celebration to remove a part of a boy's penis is nonsense.

A.Ç.B.: I'm not sure about having a circumcision for my son. If we decide to do it, it'll be for health reasons. But I won't follow all rituals; I aim not to. I'll tell my son that I don't

want him to dress up like a hero for the party …If we have to, you know, so that he won't get ridiculed by his friends for not being circumcised … there won't be a traditional party, all dressed up, hair done and so on... I'll fight against it.

Although tensions regarding shopping between feminist mothers and children have been analyzed previously (e.g. Miller, 1997), tensions between feminist mothers and individuals other than children with regard to consumption practices have not been addressed. Current findings indicate that participant mothers influence, sometimes even dominate, other people in their consumption practices, contrary to their feminist ideology which rests on critical subjectivity, opposing all forms of domination in principle. They have negative attitudes about excessive spending and try to struggle against it no matter who decides. They take the initiative not only for their own but also in other peoples' lives. Their conflictual relationship with the capitalist system surpasses their feminist reflexes against domination contingent upon the nature and amount of consumption.

B.K.: We buy things we like only on special days or when we see something reasonably priced. We don't buy expensive things. My sister had purchased a baby chair for my daughter. She insisted on buying Chicco brand, so we argued. We've tried to avoid consumerism But we try to hinder my mom. The other day, after entering a baby store, she grumbled, 'God, help me so I won't buy any of those fabulous things.' We laughed at how much pressure we put on her.

Consumer Socialization: Feminist Shaping (Attempts) of (Subjectivity) of Future Consumers

Studies reveal that feminist mothers problematize traditional child-rearing practices, and prioritize the construction of subjectivities of their children (e.g. Gordon, 1990; Martin, 2005; Phadke, 2013) through empowerment of, and a continuous dialogue with, the child. Consistently, current findings reveal that fostering self-awareness and self-confidence of the child is among the aims of participants' child-rearing projects. These projects involve the quest for a 'strong personality', 'humanity', 'respect hard work', 'self-sufficiency', 'societal concern', 'aesthetic taste', 'physical and mental consciousness of being a woman' for daughters, in other words for qualities that indicate modern agency and subjectivity. Providing freedom to choose and respecting the rights and preferences of the child as an individual are among the issues to which feminist mothers are concerned (Phadke, 2013). Informants explained how they attempt to shape the subjectivity of the child and provide them with the tools necessary to make their own decisions, even though at times these issues may not comply with the mother's views and cause stress for them.

E.D.: Last weekend, my daughter suddenly decided to become a vegetarian. She was influenced by a book. I respected that. She told me, 'You've never mocked, you didn't laugh.' I said: "Why would I? That's your choice. Let's see what happens".

Informants' sensitivity about the development of a 'neutral', i.e. egalitarian gender identity differentiates their worldview from other mothers. In addition to shaping (attempts) their children's subjectivity and personal growth, they also work toward raising critical awareness about gender inequalities. The following quotation illustrates how they elaborate on child-rearing practices that reinforce traditional gender roles.

T.M.K.: [At day-care center] They take children to see *Snow White and Seven Dwarfs*! I don't want my kid to see it. ...Being persecuted by her stepmother, she runs away and is rescued by seven dwarves. To deserve a place to live, she has to do housework. After settling for all this, when she frees herself and needs nobody, a prince shows up. I believe that all these reinforce gender roles.

The findings reveal significant sensitivity in a child's cognitive and emotional development. Struggling with the notion that women lack cognitive abilities, participants prioritize the empowerment of daughters through cognitive development. By doing so, they develop a foundation as the springboard from which a girl learns to struggle against masculine domination.

G.A.A.: I want my daughter to be smart, not just beautiful. That's my priority. Intellect is important in the process of becoming a woman because women are already in a disadvantaged position in society. Beauty helps them until a certain age, after that they become lonely and weaker. But intellect follows you all the way. It's something that needs to be developed.

Studies indicate feminist concerns about the commercialization of children's social, psychological and physical well-being (e.g. Linn, 2010). Despite the participants' feminist anti-consumption attitude, marketing offers which are evaluated as genuine and authentic or which enable rich experiences with children fit in their child rearing and consumer socialization projects that focus on shaping children's subjectivity and gender-neutral identity. Although the extent of commercialization irritates participants, expenditure on intellectual products and experiences (e.g. entertainment shows, travel activities) are justified as an investment in the cognitive and emotional development of the child. Informants tolerate excessive spending on intellectual products and services, such as books, art and drama classes and formal education. 'Spending money on books even when they won't be read' is neither seen as extravagant nor similar to overspending on other fashion items. Their demand for an education that cultivates the child's intelligence surpasses their demand for a 'natural' life in the country. In the case of education and products that develop cognitive abilities, the participants exploit resources provided by the marketplace without feeling any tensions between capitalist ideology and their feminist worldview.

E.D.: We moved from the village to the city. I don't want her to grow up in a village. She already experiences village relationships when she visits her grandparents. But I want her

to go to a quality school, get acquainted with urban culture and develop a social network. For me, being raised in the country had some serious shortcomings. You can't learn proper etiquette. Mothers buy their children things they couldn't have for themselves in the past. I do the same when it comes to personal development, not economical things or consumption.

Major Dilemma: Health vs. Feminist Critique of Marketplace

Ger and Belk (1999) found that Turks legitimize their materialistic consumption through ethics such as altruistic consumption, instrumentalism, uncalculated pleasure, and pursuit of modernity. Current findings indicate that, similar to instrumental justification of the participants' overspending on experiences and intellectual products, overspending on health-related products for a child is justified altruistically so that it signifies a mother's devotion. For participants, avoiding expenditure on the health of their loved ones is 'out of the question'. Although their ethic to moralize their over-spending on experiences and intellectual products are drawn from feminist discourses, their altruistic ethic for justification of over-spending on health products does not encompass gender perspective. Health can be seen as a gendered phenomenon (Boneham and Sixsmith, 2006); modern motherhood emphasizes the moral obligation for women to care for family and be the 'care and health' provider. Although the participants defined themselves as feminists, they did not question the gendered nature of health. The marketplace encourages consumption and amplifies vulnerability, especially if it is medically related (The Voice Group, 2010b). Miller (2005) points to the medicalization of motherhood as indicative of the wider social structures that shape women's lives differentially in patriarchal societies. Theodorou and Spyrou (2013) illustrated how pregnancy is perceived by expectant mothers as a state of anxiety and how they engage in consumption for amelioration. Despite the marketization and commodification of healthcare in Turkey (Agartan, 2012), the participants did not develop any critical view; on the contrary, they adopted the dominant ideology of the marketplace. For instance, they take price as an indication for better quality, even of medical services. S.C. explained how she avoided public hospitals and preferred private medical service during her pregnancy despite her severe financial difficulties. The following quotation illustrates how F.C. justifies her demand for private medical services;

F.C.: You get involved in consumerist dilemmas starting from pregnancy. You visit private clinics, not hospitals, because you want special attention. You want the physician to see you as a client, not a burden.

The motives underlying the demand for products that may affect the child's health indirectly, such as food and personal hygiene products, are based on 'caring consumption' (Thompson, 1996). Consider, for instance, the case of E.D., who chose to pay more than she could afford for feeding her daughter natural sea fish, even when she cannot buy it for herself. It can be argued that the discursive understanding of health, especially a child's,

amplifies feminist problematizations of marketplace ideology. As Ger et al. (1999) argued, the contextual use of an altruistic ethic for materialistic consumption of healthcare creates a loophole that provides room for negotiations between feminism and consumption. Uncritical adoption of healthcare discourse may also rest on the socio-historical construction of birth and childcare that is deeply influenced by patriarchal tradition. It also reflects the influence of the Turkish modernization discourse on women's daily lives, which regards medicalization of child-care as an inevitable aspect of 'modern' life (Cindoglu and Sayan-Cengiz, 2010).

Permissive Parenting: Until When?

The findings demonstrate that feminist mothers adopt a permissive parenting style so long as they do not feel threatened by consumer culture and patriarchal ideology. Raising the child as a free agent and respect for the child's preferences are major themes in the data. However, they face certain dilemmas when raising a child who can exercise agency in a context saturated with values of consumption and patriarchy. Phadke (2013) remarked that the idea of childhood agency is being increasingly invested with the power to consume. Products and experiences that objectify women, such as Barbie dolls, cosmetics, clothing may be, at the same time, what children choose to partake in. Findings reveal that how feminist mothers deal with this dilemma depends on how much importance they place on childhood agency or on feminist ideology.

Intervening in the child's decisions that are aligned with consumer culture puts mothers in a position of dominance. Informants explained how they worry that the child is becoming a brand fanatic. They abandon their libertarian approach when they do not approve children's consumption practices in 'critical domains' (i.e. indecent clothing choices: girl clothing items that display a girl's body and violence-themed items such as toy guns signifying masculine domination). The findings indicate that when dealing with the issue of clothing their child, or purchase of gender-stereotyped toys or toy guns, driven by the need to protect the child from external threats, they relinquish their quest for promoting childhood agency and exercise 'legitimate' authority. Considering how the participants take the initiative not only for themselves or their child but also in other peoples', such as their own mother's, domain with an aim to dominate their consumption decisions in some other contexts, it can also be suggested they can ease their feminist reflexes and choose to exercise 'objectionable authoritarianism' (Hanrahan and Antony, 2005).

G.A.A.: Learning gender is a cultural process. There are infant girls' shoes with high heels. Why should she get used to these? To be a whole woman, get ready for the future. No, she shouldn't do it. I want her to dress comfortably; shorts, pyjamas. Everybody calls her 'a boy'. For not dressing up like those fancy little girls. And I say 'yes, he is!'

While they may choose to exercise authority over recognizing the child's own choice on grounding conditions and dominate the child's decision, they may consent a purchase decision even though it may conflict with their feminist worldview. Consider the case of E.D. She bought a wedding-like dress for her daughter when she saw her looking at her friend's dress in kindergarten with heartbroken eyes and 'despite all the feminist critiques'. E.D. rushed to buy one for her.

The participants' tolerance depends on the nature of the consumption practices; while some practices are strictly rejected and are outside the scope of negotiations like purchasing a toy gun, some trade-offs can be made after negotiations as in the case of purchasing a wedding dress.

Paradoxical Juxtapositions

The findings reveal a significant tendency toward tolerance for diverse narratives as well as paradoxical juxtapositions at opposite poles. Informants playfully consume modern and non-modern objects, and communicate their own social reality rather than the one that is constructed by others. Even though they criticize consumer culture and scrutinize it as imposed by the patriarchal capitalist ideology, they still have 'loose' boundaries for what is acceptable or not. Without limiting themselves, they may spend money on fashionable products, such as expensive jewelry, perfumes and cosmetics, so as to feel good, elegant and well-groomed.

R.K.: Consumer culture is what is imposed by capitalism. We've become captives. It impacts me in terms of clothing. I take great care in fashion; the looks, exactly. I buy pants, sweaters, jackets, shoes, boots, even when I don't need them. But I'm trying to stay on budget. I limit my purchases, but still, I shop. I love shopping. I sometimes question my feminist identity. Feminists are unadorned, you know, but I am. I combine all the lifestyles I like.

Chytkova and Kjeldgaard (2012) suggested that discourse for the modern woman entails individualism, free consumption choices and a focus on hedonistic and self-enhancement consumption. The case of Turkish feminist mothers reveals that consumption serves as a means of construction and negotiation of an identity as a modern woman. Considering the ambivalent feelings they have, it can be suggested that they suffer from inconsistencies between their feelings and thoughts. The modern era rests on consistency and continuity of identity narratives (Ahuvia, 2005). Yet, as Firat and Venkatesh (1995) suggested, in the postmodern era, plurality of identity and lack of the need for consistency among multiple identity narratives can be seen as liberatory. In the present case, the inconsistency between the temptation to gratify their desires despite their attitudes towards consumerism is solved by trying to reach a balance through avoidance of over-consumption.

The quotation below demonstrates that they also freely juxtapose traditional and modern discourses on motherhood and childcare. Their playfulness ends where their stable feminist ideological positions regarding rejection of traditional gender roles and basic rights begins.

F.C.: With modern motherhood, if we mean a type of mother that wants to grow away from their own mothers' mothering style and, instead, try to learn from books and is always in control of experts... Motherhood, which is able to combine traditional and modern, doesn't reject any of them. A synthesis seems better to me. When a baby has colic, rubbing the baby's belly with some herbal oil may be more useful than taking her to a doctor.

Discussions

The findings reveal that participants constantly negotiate and sometimes juxtapose even opposing , contradictory and unrelated meanings, experiences and cognitions. They negotiate different cognitions, practices and narratives of identity (feminist, woman, mother and consumer), and develop a practical logic based on the interplay between authentic and mass-produced, natural and artificial, branded and generic, traditional and modern, industrial and rural, over-consumption and needs-satisfaction without necessarily privileging one over another.

Analysis of the current findings in regards to the previous studies about Turkish mothers' practices (e.g. Dedeoglu, 2006; Yelsali-Parmaksiz, 2019; Cindoglu and Sayan-Cengiz, 2010) indicate that there may be variations in the extent of tensions and negotiations across mothers that define themselves as feminist or not. Playing multiple and sometimes conflicting roles complicates identity narratives and life themes. Figure 1 depicts their negotiations between their discourses of motherhood, feminism and consumerism.

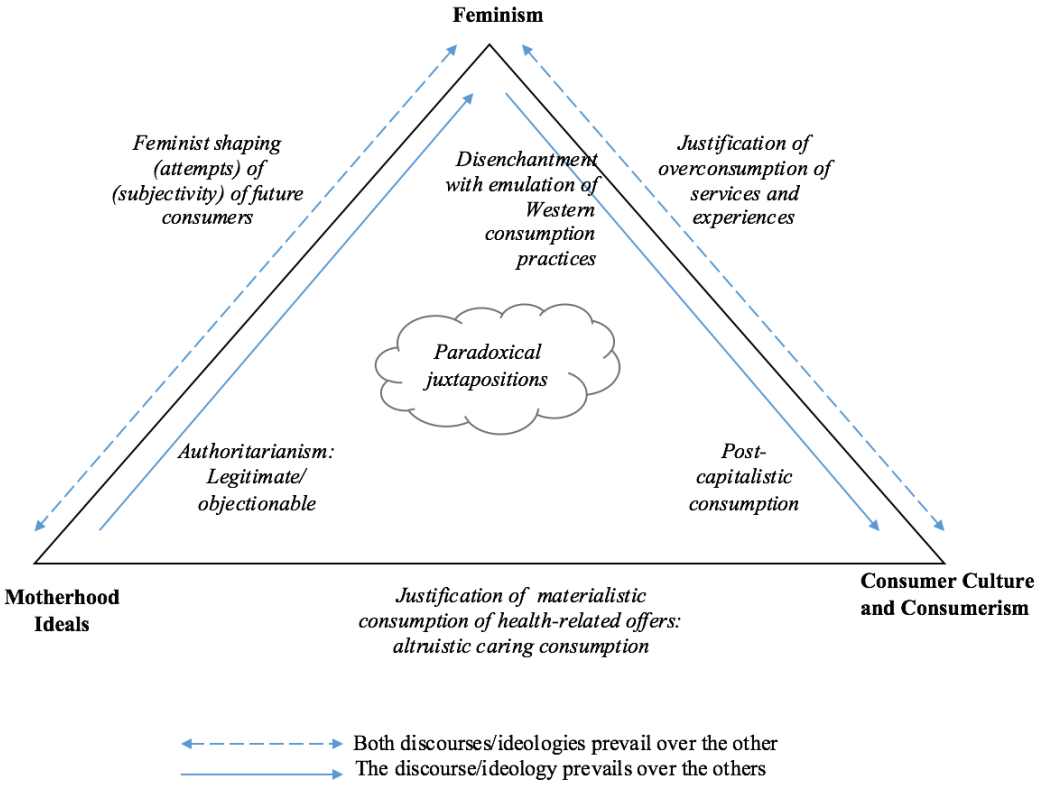

Figure 1. Negotiations between Motherhood, Consumer Culture and Feminist Ideologies

Negotiations are observed in many cases. First of all, despite their critique of consumer culture, the participants did not consider it as a major and urgent problem in the public sphere; they consider consumer culture as a threat in the private sphere that may jeopardize their own identity narratives as a woman and mother. Although they refuse to comply with marketplace behaviors to some degree, they recognize the entrenched inevitability of capitalism and consumer society. They try to find a 'balance' between their goal to develop critical subjectivity and the demands of the marketplace structure that allows limited and limiting notions of consumer agency (Phadke, 2013). They cope with the 'traps' of the marketplace by simply avoiding and protesting, or engaging in alternative market or non-market transactions. When coping strategies fail, they develop justification strategies. Although the participants' ideological critique of consumerism is aligned with the anti-capitalist tradition of second-wave feminism, an analysis of their consumption practices coincides with the post-capitalist feminist view of political economy (Gibson-Graham, 2006) that embraces practicing "non-capitalism" through emancipation from the capitalocentric discourse and marketplace, rather than opposing capitalism.

Emulation of Western consumption practices by displacing the original cultural meanings and appropriating them using market-generated symbolic resources contradicts participants' quest for authentic identity narratives. Although they criticize emulation of baby shower rituals in a non-western context, an examination of the participants' attitudes toward circumcision ceremonies reveals that, being offsprings of the Turkish modernization project that rested on western modernization, their aspirational identity has become that of the modern Westerner (Ger et al., 1999). Unlike the circumcision ceremonies that have been socio-culturally constructed for centuries, the market-generated meanings of baby-showers have not been appropriated by consumers as authentic, thus signifying the uncritical acceptance of subalternity (Varman, 2018).

Negotiations can be observed in their feminist shaping attempts of the subjectivity of future consumers. To enable the child to build his/her critical subjectivity and to construct a gender-neutral identity, they provide the child, as future consumers, with the tools necessary to make their own decisions, even if at times these may conflict with their feminist worldview. To support childhood agency, participants adopt a permissive parenting style so long as they do not feel threatened in a context saturated with consumption values which are charged with sub-texts of patriarchal ideology. They feel tensions between empowering the child to take initiative and depriving the child of free agency when their decisions are inappropriate. Findings indicate that when dealing with the issue of revealing garments for children, particularly daughters, driven by the need to protect the child from external threats, such as sexual objectification, they relinquish their libertarian attitude and quest to promote childhood agency.

Furthermore, even though they have reservations about consumerism and regard the marketplace redolent with 'traps', they uncritically consent to (over)consumption of experiences and intellectual products. They use them as tools to accomplish their feminist child-rearing project. Materialistic consumption of health-related products are justified altruistically as it signifies a mother's devotion. Their discursive understanding does not rest on any critical feminist inquiry of health, as a gendered phenomenon, or the medicalization of motherhood. Motivated by motherly devotion and altruistic caring consumption (Thompson, 1996), they tend to adopt the dominant ideology of the marketplace, even the simplest heuristics of price and quality. Their consumption practices rest on the socio-historical and patriarchal patterning of meanings around birth, health and childcare. Their understanding of health, as a part of 'modern life', can be seen as a product of the Turkish modernization project.

The third main theme of negotiations emerges from the clash of the individual agencies of mother, child, or other people, such as their own mothers. Taking the initiative out of the child's hands can be deemed legitimate under conditions of external threats to feminist child-rearing projects that aim to shape the critical subjectivity and gender-neutral identity of future consumers. However, in some other consumption contexts, despite their feminist worldview that opposes all forms of domination, participants also dominate the child's and

other peoples' consumption decisions and still seek justification in an attempt to avoid inconsistency.

They assess and weigh their reasons for action and extend or adapt their behavior in many possible ways. So they avail themselves of the benefits of achieving a consumer's goal without necessarily suffering from cognitive dissonances. Based on multiple roles and identities, they reflexively (re)construct the logic of their practice based on negotiations between material and symbolic interests and a few generative principles. For Gabbay and Woods (2003: 14), a practical logic is "a theory of what practical agents think and reflect upon, cogitate over and decide, and act". Human reasoners are also adept at recognizing and manipulating defaults. Bourdieu (1977) remarked that a logic of practice is 'able to organize the totality of an agent's thoughts, perceptions, and actions by means of a few generative principles, themselves reducible in the last analysis to a fundamental dichotomy, only because its whole economy, which is based on the principle of the economy of logic, presupposes a loss of rigour for the sake of greater simplicity and generality'. He noted that polithesis, i.e. the confusion of spheres, results from the highly economical application of the same schemes to different logical universes. A logic of practice is defined by the agent's practical relation to the situation apprehended through the generative schemes (Bourdieu, 1977).

In line with Bourdieu's conceptualizations, it can be proposed that, driven by material and symbolic interests, participants' practices incorporate a polysemous quality based on their multiple identities and different discourses in which they are positioned. These range of discourses can be conceived 'as a series of discontinuous segments whose tactical function is neither uniform nor stable' (Foucault, 1978b). They emerge in various particular, rather than universal, strategies and even co-exist within the same strategy in an attempt to construct a logic of their practice. The participants do not seek a uniform logic of practice; rather, they negotiate different, yet complex, narratives and ideologies to construct a logic of their practice.

In their study that focuses on new middle class consumers in Turkey, Kravets and Sandikci (2014) identified three salient new middle class sensibilities that crystallize into a particular mode of consumption which entails working with a standard set of products and rules and creating distinct combinations that can be assembled and reassembled consistently to produce individualized outcomes.They suggest that this"formulaic creativity" helps these consumers "to reconcile the disjuncture between the promises of neoliberalism and the realities of living in unstable societies that have distinct political-economic,social-cultural conditions and historical experiences". This kind of formulaic creativity also requires practical cognitive agency and logic. Our participants' logic of practice incorporates a polysemous quality based on multiple roles and ideologies through the instrumental use of consumption for self-enhancement and gratification of desires and by freely juxtaposing traditional and modern dis-

courses on motherhood, in addition to negotiations between consumer culture and feminist ideology. Their playfulness, which is enabled by by their social class positions and other structural, intersecting factors, ends where their stable feminist ideological positions regarding rejection of traditional gender roles and basic rights begins.

Conclusion

The present study focuses on the consumption practices of Turkish feminist mothers by analyzing how they construct and negotiate identity narratives, with an attempt to shape the subjectivity of their children as future consumers, and cope with tensions that emerge in the problematic juncture between feminism, motherhood, and consumption. A phenomenological analysis indicates that the extent of tensions and negotiations varies across mothers that define themselves as feminists. Identification with an additional identity category escalates the extent. Based on an analysis of the negotiations, we propose that feminist mothers do not seek a uniform logic of practice; rather, they negotiate different, yet complex, discoursive narratives to construct their logic of practice. Their consumption practices are grounded in the interplay between discourses of motherhood, feminism and consumerism. Playing multiple roles, they negotiate and sometimes juxtapose even oppositional, and unrelated cognitions, practices and identity narratives (feminist, mother and consumer).

Even though the present study analyzes consumers who sit at the crossing axes of different identities and reveals how their practices incorporate a polysemous quality based on their intertwined roles and discourses, it suffers from having a broad focus. Future studies should be designed with a narrower focus. Moreover, the study suffers from limitations of phenomenological analysis, such as reliance on a comparably narrow set of participants in a socio-cultural context. Future studies that focus on diverse socio-cultural contexts may reveal the extent of negotiations.

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RESEARCH ARTICLE

Impact investing: A review of the current state and opportunities for development

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Abstract

United Nations Sustainable Development Goals (SDG) are a universal call for action to protect the planet, end poverty and inequality in the world. Government and philanthropy resources are not sufficient to achieve these goals and financial resources from capital markets must be directed to them. Impact investments are "investments made with the intention to generate positive, measurable social and environmental impact alongside a financial return" and can act as a catalyzer to canalize the needed capital to achieve SDG targets by 2030. This paper investigates this emerging financial paradigm, impact investment. History of impact investment and how it differs from socially responsible investment is presented. Several countries have taken initiatives to develop a regulatory framework to support social enterprise financing. Major actors in the impact investment market are private investors, institutional investors, private foundations, banks, development finance institutions, and nongovernmental organizations. Innovative financial structures are developed among these actors along the risk-return spectrum. Impact investing will thrive if ecosystem actors work against the barriers and use the opportunities well. More academic research and training programs are needed to contribute to the development of the impact investment field.

Keywords

Impact investing, Social finance, Social enterprise, Social enterprise financing

Introduction

The Paris Agreement and the Sustainable Development Goals (SDG) call for taking action against depressing environmental and social challenges such as global warming, hunger, poverty, environmental problems, and social inequality. This action is necessary more than before while the world is going through the COVID-19 pandemic and health and economic crisis hits the disadvantaged people more (Bonnici & Raja, 2020). Social innovators or disruptive innovators who are brave enough to tackle problems that others could not solve are sought actors. There is a specific call for investors to channel financing towards solutions to these environmental and social problems. To achieve the SDGs in developing countries, the financing gap is estimated to be US$2.5–3 trillion per year, according to the United Nations.

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Government and philanthropy resources are not sufficient to solve the most critical challenges in the environment, healthcare, unemployment, housing, and education and financial resources from capital markets must be directed to them. Impact investing can act as a catalyzer to canalize the needed capital for innovative social entrepreneurs that seek to provide market-based solutions to these numerous challenges and achieve SDG targets by 2030 (Martin, 2013). This paper investigates this emerging financial paradigm, impact investment.

Impact investments are investments for 'blended value' and aim for social, environmental, and financial returns (Emerson, 2003). They are made in social enterprises (profit, non-profit or hybrid organizations) that provide market-based solutions to environmental or social problems that the investor wants to address (Johnson et al., 2018). Impact investees intentionally create as well as measure environmental or social values and not have them as side effects (Nicholls & Daggers, 2016). In other words, expected impact returns are apriori defined and measured ex-post (Calderini et al., 2018). Impact investments require the payment of principal with a potential return and can take place as equity, debt, or a hybrid of these investments. Impact investment differs from government funding or philanthropy with its financial return aim and differs from a traditional investment with its positive impact aim (Nicholls, 2010).

Daggers and Nicholls (2016) note that the academic research in impact investment lags practitioner research led by networks like Global Impact Investing Network (GIIN). According to the network, impact investment is a movement in the sense that the role of money is redefined and positive impact is integrated into the decision-making processes of individuals and organizations. The social or environmental positive impact will be an important criterion for individuals' economic choices, business conducts, and investment evaluations. They define impact investing as an industry comprising investors, support institutions, and field builders who will contribute to the development of the market by developing new financial assets, impact measurement, and management tools.

Shareholder wealth maximization has long been challenged as a key purpose of businesses and replaced by stakeholder value maximization in the long term. Businesses and investors are not only accountable to shareholders but multiple stakeholders, namely customers, employees, suppliers, community, and the environment (Asher et al., 2005; Friedman & Miles, 2002; Harrison & Freeman, 1999). Every investment has a short and long-term impact on society and the environment and investors who finance these investments contribute to this impact. In this respect, businesses and investors have utmost responsibility in society while making investment decisions and channeling funds to the most effective solutions (*Principles of Responsible Investment Annual Report*, 2018). GIIN has been leading impact investment field-building and suggests that there is a need for a significant change in the role of money and investors' responsibilities (Bouri et al., 2018). With this new paradigm and role for finance, capital will support essential sustainable growth and flow to organizations that create

a positive social or environmental impact (Martin, 2013). In this respect, businesses will also make sure they create a positive impact not only on financial returns.

In the next section, a brief history of impact investment is discussed followed by regulatory background. Section three reviews the impact investing ecosystem. Section four reviews why impact investment matters for social enterprises. Innovative financing structures are introduced in section five. Section six discusses opportunities for the development of the impact investment markets followed by the conclusion.

History of Impact Investment

In recent decades, there has been a shift toward consideration of nonfinancial factors in investment decisions. Socially responsible investments (SRI) are also called sustainable investments or ethical investments. They have emerged in the 1970s when investors started to avoid specific industries or companies that may have significant negative effects on people and the planet. As an investment approach, SRI integrates social, ethical, and environmental concerns into investing decisions. In contrast to traditional investments, SRI screens investments based on social, ethical, corporate governance, or ecological criteria. SRI brings shareholder activists and local communities on board to expedite corporations to incorporate these criteria in the corporate strategies (Renneboog, Host, et al., 2008). Initially, investors avoided companies that sell harmful substances such as guns or tobacco and sought ones engaged in sustainable activities like clean technology and energy efficiency. Through time Environmental, Social, and Governance (ESG) criteria have become the major foundation of SRI (Widyawati, 2020).

SRI grew from 8.7 trillion dollars in 2016 to 12 trillion dollars in 2018, a 38% increase in the United States alone. This corresponds to 1 for every 4 dollars of assets invested under professional asset management in the USA, according to US SIF. Impact investment lags with 502 billion dollars invested in impact investing assets worldwide in 2019, but the marketplace is growing (Mudaliar & Dithrich, 2019). In the SRI literature, financial performance is a popular research topic. This literature analyzed the returns of mutual funds, portfolios, and trusts, but the results are mixed. Some studies show that SRI portfolios do not significantly differ from traditional portfolios in terms of financial performance (Derwall & Koedijk, 2009). Alternatively, there is evidence that SRI portfolios outperform (Kempf & Osthoff, 2007) and underperform (Renneboog, Horst, et al., 2008) traditional portfolios.

Impact investing builds on these responsible investment approaches, and besides financial returns, impact investors are looking for impact in investment decisions. In other words, investors look for enterprises or organizations that make a positive impact on people's lives or environment. Impact investors must intend to contribute to the solution of the world's ut-

most critical environmental and social challenges. This is one critical respect of how impact investment is different from ESG investing or SRI (Harji & Jackson, 2012; Nicholls, 2010; Ormiston et al., 2015) and investors can select a thematic focus such as providing scalable solutions to underserved people or regions. While working with these challenges, impact investments still expect a financial return, and this is their key difference from philanthropy.

Targeting specific social or environmental objectives, intending to create a positive and measurable impact besides a financial return, and measuring the attainment of both are key actions that differentiate impact investments from conventional investments (Social Impact Investment Taskforce, 2014). Together with prominent impact investors in the world, GIIN defines four basic principles of impact investing. First, impact investors must intend to contribute to positive environmental and social impact. They will not only set financial goals but set an investment agenda for social and environmental threats that they want to address and strategies on how to realize these. Second, they must integrate impact evidence and data in their investment design. Based on quantitative and qualitative data, they must set targets for how they will contribute to the challenges that they aim to address. They need to use evidence and impact data to measure performance against these targets and their impact. Third, they must manage impact performance, identify and assess potential risks and negative consequences and mitigate these. Impact reports are then disclosed to investors and investees. Finally, they need to contribute to the growth of impact investing. They must be transparent in investment practices and share their positive and negative lessons that are not private with the investment community.

The United Kingdom is one of the leaders in the development of impact investing. In 2000, the UK treasury built a social investment task force to attract private capital into social enterprises, especially in deprived areas. This was later followed by the establishment of Big Society Capital, a financial institution set up in 2012 to build and develop the UK's impact investment market. It helps social enterprises and charities to find fitting repayable finance to tackle social and environmental problems and increase their impact on society. G8 under UK's presidency, then established Social Impact Taskforce in 2013, to catalyze impact investments worldwide. As the successor to this task force, the Global Social Impact Investment Steering Group (GSG) was formed in 2015 with a wider membership. The group currently has 18 countries and the EU as members.

Around the world, there have been several policy developments to build the impact investment market. The UK also pioneered in modeling tax incentives for social investors and introduced the Social Investment Tax Relief (SITR) program in 2014. SITR offered a 30% tax break of investments (loans or equity) made to social purpose organizations. SITR has helped entities such as social enterprises, charities, community benefit societies, community interest companies, and social impact contractors that have difficulty in raising funding through tradi-

tional finance at reasonable costs. France is another country that has developed a regulatory framework to support social enterprises. France introduced the first 90/10 bill in 2001 and obliged companies to offer their employees a socially responsible savings scheme. Companies can invest between 5 and 10% of their savings into organizations and activities with a 'solidarity label' voluntarily. In 2008, France made these investments compulsory and these savings present a considerable source of patient capital as direct investments to social enterprises or through 90/10 Solidarity Funds. Corporate Social Responsibility (CSR) is another way businesses can contribute to sustainable development. India is one of the first countries that made CSR mandatory for companies with the Companies Act in 2014. Businesses that meet certain criteria are obliged to allocate 2% of their net average profit in the last three accounting years to CSR activities in rural development and environmental sustainability.

The prime target of impact investors are social enterprises, and their legal structures affect the type of financing they can access. Legal structures are critical in getting tax benefits and types of funding options for social enterprises. Different legal structures for social enterprises have been created around the world. United Kingdom established Community Interest Company (CIC) in 2004. CIC is a company formed for social or community benefit, and even though limited dividends can be distributed to the investors, surpluses are mainly reinvested in the business (Reiser, 2011). The United States introduced 'low profit limited liability company', a hybrid business form that combines a socially oriented mission with a for-profit business entity. B Lab also certifies a corporation that has a dual mission of creating a social or environmental impact and making profits as "B Corp" since 2006. Another form of a business corporation is "benefit corporation" and it has three distinctive features: (1) it has a business objective to create a positive substantial impact on the environment and society; (2) managers need to take into consideration stakeholders' interests besides shareholders' financial interests; and (3) reporting on the environmental and social performance using independent third-party standards that are transparent, comprehensive and credible that is required every year (Clark & Babson, 2012).

Impact Investment Ecosystem

The chief actors of the impact investing ecosystem are investors (supply side), investment seekers, mainly social enterprises (demand side), financial intermediaries, support organizations, and governments. On the supply side, several actors have been working to fuel the flow of funds to social enterprises that need funding to develop and grow. Investors' expectations for financial return and impact return may be different and based on their objectives they are characterized as 'financial first' or 'impact first' investors (Freireich & Fulton, 2009). 'Financial first' investors, usually because of their fiduciary duties, aim to generate market rates of return from investments with a social or environmental impact. These investors mainly

include banks, development finance institutions, pension, and wealth funds. 'Impact first' investors intend to maximize environmental or social returns with a minimum obligatory financial return. Many foundations and family offices prefer to be 'Impact first' investors. If impact return is sufficient, these investors are satisfied with below-market-rate financial returns (Thornley & Dailey, 2010). Impact first investments have shown that they could generate market-rate returns and generating impact not necessitates below market rate returns (Lyons & Kickul, 2013). Investors with diverse preferences regarding the return, impact, and risk may co-invest in hybrid structures (Lyons & Kickul, 2013). Such hybrid designs can attract profit-oriented capital toward impact investment and increase the availability of funds for social entrepreneurs.

Investor diversity is an important feature of vibrant impact investing ecosystems (Roundy, 2019). Investor diversity means investment interests will cover a wider set of impact themes, geographical focus, business models, life cycle stages, and returns. In more diverse impact investing ecosystems, the likelihood that a match between a funder and fund seeker resulting in completed deals is higher (Roundy, 2019). Besides individual investors, corporations, and governments, the following are the major actors on the supply side:

Institutional investors

Institutional investors entered the impact investing market in 2014. Several biggest investment funds in the world such as Blackrock started offering sustainable investment funds. Pension funds have also started making impact investments, and if the number increases, they can be a critical source of capital for social enterprises. For instance, the world's biggest pension investment fund belongs to the Japanese Government, and the fund invested 8.9 billion dollars to businesses that have strong ESG practices (Sano, 2017). Because of fiduciary duties, these mainstream investors look for the minimum market rate of return for their investments (World Economic Forum, 2013). Besides institutional investors, angel investors and professional investors are also providing capital and business expertise support.

Development Finance Institutions (DFIs)

DFIs are development banks or subsidiaries formed in economically developing countries to support the advancement of the private sector. National governments usually own them and national/international development funds mainly fund them. According to OECD, this helps them raise large sums of money from international capital markets and offer competitive financing. This is a critical source of funding for social enterprises. For example, the European DFIs together manage a portfolio of impact-oriented investments totaling about $50 billion in developing and frontier markets. The DFIs in Europe have been leading responsible financing to enable sustainable development. They have profound experience in impact investment and have long been committed to measuring impact for SDGs effectively.

Non-Governmental Organizations (NGOs)

NGOs have mainly relied on donations and grants for funding. Trends in capital markets have also changed NGOs' funding sources and how they design interventions. Many donors expect their financial contributions to be used strategically in solving root causes of challenges in society. This is a key difference between charity and philanthropy. The primary reason many NGOs have created or are looking to create their impact investment funds is to increase their access to this private funding.

Philanthropic Investors

Foundations are one of the critical actors leading the development of the market by providing capital, supporting capacity building to increase deal flow, sharing best practices, and reducing transaction costs (Martin, 2013). Several charitable trusts, foundations, and family offices are making impact investments in line with their missions, and this helps them increase their endowments. Family offices and wealthy individuals have been the most active among impact investors because of their high level of autonomy and flexibility in investment decisions (World Economic Forum, 2013). Ford Foundation set aside one billion dollars from its endowment to achieve social and environmental good besides financial returns (Lim, 2017). Foundations have also taken part in 'blended finance' deals and provided catalytic capital. OECD definition for blended finance involves using development finance tools strategically to mitigate risk in order to mobilize additional capital towards sustainable development in economically developing countries. The purpose in blended finance is to support high impact projects that cannot attract private sector financing initially but have high potential for success. One approach is to blend 'concessional financing' and traditional financing. Concessional financing provides more favorable terms than traditional financing, for example, interest rates lower than market rates or longer grace periods.

Demand for impact investment is mainly from impact-oriented businesses, cooperatives, and non-profits generating income, and these entities are referred to as 'social enterprises' (Martin, 2013). These entities may have different legal forms, but they have one thing in common: they seek to achieve both a social impact and a financial return. Usually impact objectives are in line with the business model and financial and impact returns are compatible (World Economic Forum, 2013). Charities also find impact investing as a beneficial funding option and consider setting up a social enterprise in their expansion plans (Big Society Capital & ACEVO, 2015). Impact investment has become a critical source of funding, especially for the social innovators who aim to solve critical environmental or social problems and have difficulty accessing mainstream capital markets (Clarkin et al., 2014; Harji & Jackson, 2012; Mendell & Barbosa, 2013; Nicholls & Murdock, 2012; Ormiston et al., 2015; Roundy, 2019).

The increase in the number of social enterprises contributed to the development of the impact investment market (Wilson, 2014). Social enterprises have difficulty in accessing ma-

instream financial markets, and the impact investment market has grown to address these financing needs. The reason social enterprises may have more difficulty in accessing mainstream financial markets than traditional or commercial enterprises may be because of the following differences. First social entrepreneurs are committed to social benefit creation (Dacin et al., 2010; Zahra et al., 2009) and address social needs that commercial enterprises do not attend to (Mcmullen, 2011). For this reason, they may appear less appealing to investors and lenders regarding earning money (Doherty et al., 2014; Lumpkin et al., 2013). Social entrepreneurs employ market-oriented methods to find solutions to social as well as environmental problems (Grimes et al., 2013). They are hybrid organizations, and their biggest challenge is the contradiction between the institutional logics of the market and social welfare (Pache & Santos, 2013). Wealth accumulation is not their priority, and they reinvest profits toward the growth and achievement of their social mission (Hartigan, 2006; Haugh, 2006). Financial returns are necessary for sustainability and social entrepreneurs have to balance financial and social concerns well (Dacin et al., 2010). Because of their social concerns, social entrepreneurs have access to community-based resources such as grants, individual contributions, and government funds (Austin et al., 2006). Unlike traditional entrepreneurs, social entrepreneurs are also accountable to such outside stakeholders and most important of all to their communities (Domenico et al., 2009).

Besides the supply and demand side of the capital, the impact investment landscape also includes government, networks, financial intermediaries, support organizations, and professional service providers who have significant roles in the market building. Support organizations like accelerators and incubators provide investment readiness programs and other resources such as office space, mentoring, connections, and investor meetings that enterprises need to scale up (Casasnovas & Bruno, 2013). In case they cannot provide resources directly, they serve as bridges between enterprises and the broader ecosystem resources (Goswami et al., 2018). They contribute to the development of connections and the deal flow in the ecosystem. Support organizations can also contribute to the ecosystem by organizing impact investment awareness-raising and educational activities for the ecosystem participants.

Financial intermediaries link investees and investors and contribute to the ecosystem by providing liquidity and facilitating payments. Intermediaries may include banks, social exchanges, and financial advisors.

Social Banks/Private Banks

Social banking targets positive social or environmental impact through finance. The private banking sector has begun establishing units for impact investing in 2008. Banks can also offer microfinance loans, green bonds, and private equity funds of funds for impact investment. In 2007, JP Morgan set up a Social Finance unit to co-invest with impact funds and

in 2012, Morgan Stanley established its 'Investing with Impact' platform that offers various investment assets that provide both impact and financial return (World Economic Forum, 2013). Credit Suisse, Swiss Bank, Triodos Bank, Deutsche Bank, and UBS are some of the largest banks that have made impact investments.

Crowdfunding Platforms:

Crowdfunding is raising small amounts of capital from many people via online platforms. It has emerged as a viable funding option for traditional finance and comes in investment and non-investment models. Investment models include debt or equity models and non-investment models include reward-based and donation crowdfunding models (Yasar, 2021). Social and environmental orientations affect the funding success of reward-based campaigns (Yılmaz & Yasar, 2021). Cambridge Centre for Alternative Finance discusses the different models and assesses the global market in a recently published report (CCAF, 2020).

Exchanges and Platforms:

Exchanges and platforms facilitate the identification of and access to impact investment opportunities for impact investors. Social stock exchanges are regulated platforms where social enterprises that aim to provide solutions to the social challenges of the "base of the pyramid", can raise funds from impact investors (Wilson, 2014). The first social stock exchanges were established in the United Kingdom, Canada, Singapore, and South Africa. Besides access to investment opportunities, platforms provide information resources and searchable databases. For example, ImpactBase is an online global platform where accredited impact investors can search for funds to invest in line with their investment preferences for impact themes, geographic focus, asset classes, fundraising status, investment size, and other criteria. The development of a coherent impact investing ecosystem depends on the contributions of all the ecosystem actors and coordination and cooperation among themselves.

Global networks such as GIIN and Impact Investing Policy Collaborative (IIPC) contribute to the ecosystem by market-building activities. Impact Reporting and Investment Standards (IRIS) and the Global Impact Investing Rating System (GIIRS) work on developing common standards and metrics for impact measurement and reporting. Common standards and metrics enable comparing and contrasting impact investments in terms of impact features. Besides assessing financial benefits using traditional due diligence practices, impact investors, need to screen for impact. Afterward, they need to check whether they achieve their impact objectives, such as access to energy/medicine/clean water/education/technology/affordable housing/financial services or reduction of carbon emissions/harm to the environment. Hence, impact measurement and management are a critical part of impact investing. IRIS+, together with Impact Management Project (IMP) defines dimensions for impact description and measurement: 'what', 'who', 'how much', and 'risk'. Under the 'what' dimension, investors, and

enterprises use data to distinguish the outcomes that they contribute to and the significance of these outcomes to the people or the planet. Some example IRIS metrics are direct greenhouse gas emissions, average agricultural yield, or student transition rate. Under the 'who' dimension, data related to the stakeholders that are affected by the intervention and how underserved they are regarding the generated outcomes is collected. Some example IRIS metrics are target stakeholder socioeconomics or demographics. 'How much' dimension measures the scale or the number of individual clients affected by the outcome, the depth or the level of change in outcome over time, and the duration of the outcome. Risk measures how much the enterprise contributes to the outcome versus what would have happened.

Governments play key roles in the regional ecosystems to foster an enabling environment and catalyzing market development (Wilson, 2014). They have dual roles in the ecosystem as both capital providers and facilitators. Governments can facilitate investment products with impact and financial returns, as well as provide tax incentives to stimulate impact investing markets. On the supply side, governments can increase the amount of capital for impact investing via development policies such as direct investment, co-investment, or risk-sharing (Martin, 2013). On the demand side, governments can advance demand development policies such as promoting capacity-building activities to increase the number of investment-ready enterprises.

Why Impact Investment Matters for Social Enterprises?

British Council documents the financing gap in Turkey (British Council, 2019) and many other countries for social entrepreneurs. Accessing financing has been a challenge for most enterprises seeking to make it through the "valley of death" and grow. Getting debt and equity finance has become even harder after the credit crisis in 2007 (North et al., 2013). Financing challenge is more pronounced for some of the impact enterprises which aspire to address societal and environmental challenges and create a positive impact (Castellas et al., 2018; Emerson et al., 2007; Nicholls, 2010). Social entrepreneurs may experience difficulty in raising money because they neither fit into traditional for-profit nor into non-profit models (Chertok et al., 2008). What social entrepreneurs choose as a legal structure for their enterprises affects funding options from philanthropy and traditional investors (Lyons & Kickul, 2013). Reasons early stage enterprises may have difficulty in accessing finance and why some impact enterprises may find financing tailored for their needs even more challenging than traditional enterprises are discussed below.

Insufficient collateral and lack of a trading record are common factors that create a disadvantage for early-stage enterprises that apply for debt financing (North et al., 2010). The main reasons impact enterprises cannot access banks' loans are their higher perceived credit risks and lack of collateral. In this respect, available loans to impact enterprises are limited

and may have higher interest rates. Early stage enterprises often do not have established relationships with banks again limiting their access to traditional financial instruments. In terms of equity investment, exit strategies observed in traditional enterprises might not be suitable for social entrepreneurs. An "exit" is investors' means of getting the return on their investment, including their profit and their original capital. Common exit strategies for commercial enterprises are via initial public offering or selling the enterprise to a bigger company. Social entrepreneurs aspire to continue their enterprises' missions and may avoid any structure that will dilute their ownership and voting rights. He/she may not want to transfer the company to a third party who may not come from the same community or be fully committed to the impact mission sought.

Impact enterprises may not attract angel investors or venture capitalists because of lower potential returns. Some of the impact enterprises serve the geographies where the market potential is very limited or the poorest at the base of the pyramid and the beneficiaries may not pay for the product or service directly (Godeke & Bauer, 2008; Lyons & Kickul, 2013). While they may create a high impact, the financial return may not be satisfactory for the investors who are only looking into financial returns. Another challenge in impact enterprise financing is the non-alignment of time horizons of impact investors and enterprises (Lyons & Kickul, 2013). Traditional venture capitalists have to make exits and return the money to their investors within seven to ten years. Impact enterprises, on the other hand, may require longer time horizons to achieve profitability and create the impact they aim for. They address the most challenging problems of the world, and most often they operate in tough and traditionally overlooked markets. Moreover, having two missions, creating financial returns for investors and social returns for beneficiaries, can create conflicts that can impede enterprises' growth (Rottenberg & Morris, 2013). In this respect, expecting impact enterprises to achieve business development and meaningful returns in time horizons comparable with commercial enterprises may be unfair in certain cases. This creates a barrier to attract traditional investors who expect to receive a financial return to compensate for the risk they take (Lyon & Owen, 2019). The tradeoff between financial goals over social goals more likely result in a faster path to scale. Impact enterprises that seek equity investing need to devise a business model that aligns social and financial goals as closely as possible to lessen tradeoffs (Rottenberg & Morris, 2013).

Another reason impact investing is critical for social enterprises and why they need innovative financial assets tailored for them is the broad range of contexts in which they operate. As Armeni and Ferreyra de Bone 2017 frame it, some impact businesses may scale up and become very profitable while others can look like nonprofit organizations. Because of the wide-ranging contexts they operate in, funding mechanisms of social entrepreneurs must be innovative and broad. Social enterprises range in operational size and it would be unjust to expect investment terms that have funded Uber, Instagram or Snapchat would serve their ne-

eds as well. Traditional methods such as debt or equity only may not suit the financing needs of early and growth stage impact enterprises. In this respect, experimentation in deal structuring and innovation in financial assets are needed to improve the impact investing field.

1. Innovative financing structures

Fund managers and experts in the field have been experimenting with new financing structures including equity, debt, and grants to accommodate the capital requirements of impact enterprises. Foundations, impact investors, development agencies, and other funders share their innovative models at global summits and workshops organized throughout the world. These financing structures include a mix of traditional debt and equity in line with the needs and stages of impact enterprises. Needs of impact enterprises differ based on their expected time to profitability, cash flow generation, risk, potential, exit opportunities, and preferences of the entrepreneurs. The type of capital demanded by most social entrepreneurs is patient capital, capital that is long term and risk-tolerant (Lyons & Kickul, 2013). According to the Acumen Organization, patient capital's main traits are risk tolerance, long investment time horizons, flexibility to meet social entrepreneurs' needs, and unwillingness to give up on end customers' needs for the benefit of shareholders. Some of the innovative financial instruments used in these structures are as follows:

Revenue-based loans: These flexible debt instruments allow organizations to remit periodic payments as a percentage of revenues, cash flows, or profits rather than periodic fixed payments as in traditional debt instruments. Payment times are flexible and include grace periods. There are no strict collateral requirements. One type of revenue-based loan is 'convertible revenue loans' which can be converted to equity after a percentage of the loan has been paid off with revenues.

Revenue-based equity investments: In these alternative models, dividends and payments to investors are made as a percentage of profits or revenues. Unlike traditional equity models, where exits usually happen through mergers, acquisitions, or initial public offerings, in these models, investors are more likely to sell shares back to the business. Gradual equity redemptions are also possible, and entrepreneurs can redeem shares gradually at a predetermined price.

Social impact bonds: Social impact bonds are introduced in the United Kingdom and they are called 'development impact bonds' in emerging markets. This structure changes how governments fund social interventions. A non-government funder, most often a private investor who can be an individual, foundation, philanthropy, or another funder, finances upfront the social service intervention. If the intervention is successful and reaches the target outcomes agreed at the beginning, then the government pays the funder. If the intervention is unsuccessful, then the funder takes the loss. These structures are called 'Pay for success' in the

United States because not all structures are bonds and social service providers are paid only if their interventions are successful. Green bonds are a special case of impact bonds and finance projects that have a specific positive environmental impact such as reduction of carbon emissions, renewable energy, energy efficiency, or sustainable agriculture. Charities or social enterprises may issue charity bonds if they have revenue streams and the financial capacity to repay the bondholders.

Recoverable grants: Recoverable grants differ from traditional donations in terms of repayment possibilities, i.e. the grant can be repayable if the entrepreneur gets an investment or fails to achieve the target impact. Innovations in grant structures are highly different from traditional financing. Donors to charity are looking for more strategic use of their financial contributions, and there is a shift of charity dollars to philanthropic capital. Philanthropic investors are interested in the created impact but also aim for recycling their capital. In new structures, philanthropic capital appears side by side with debt or equity.

Opportunities for the Development of Impact Investing

Impact investment definition is still not clear cut and can represent different meanings to different people. GIIN draws attention to the need for defining a common set of characteristics of an impact investor (Bouri et al., 2018). The field will benefit from identifying and framing impact investing and developing a common language. The impact investing research is emerging and there is yet no marked theory or substantial datasets (Nicholls & Daggers, 2016). In collaboration with practitioners, academic research can contribute to the development of impact investing as the impact investing market needs a critical assessment of the current path and new financial models, investment products, tools, and services. Traditional finance theory and models are based on risk and return expectations. The critical question is how to value a financial asset that provides social/environmental return besides a financial return (Nicholls et al., 2015).

The theoretical models need to be revised to incorporate social or environmental impact besides risk and return. In line with these models, new investment products need to be introduced for investors with different risk appetites and investment time horizons (Wilson, 2014). The capital needs of entrepreneurs at different stages must be taken into consideration while developing products. Financial products must also differ for institutional investors and retail investors. So far several impact investing funds which invest in a variety of themes such as healthcare, aged care, clean energy, housing, sanitation, education, and financial services and geographies, have been established. Several established traditional asset managers also entered the market and started their impact funds. However, investment banking services are still limited. To develop the market, innovating financing mechanisms and flexible products that meet different investors' needs and preferences are critical. Such innovative products that

provide exit strategies or a secondary market are also important for ensuring liquidity in the market (Mendell & Barbosa, 2013). Investors can use these assets for portfolio diversification. If institutional investors implement a 'financial-first' strategy then they will also fulfill their fiduciary duties (Ormiston et al., 2015). Building a track record of impact investments is critical for engaging more investors and the development of the field.

There is a gap in how investors implement impact investment strategies and how they overcome challenges (Ormiston et al., 2015). The field can use publicly available data and case studies to benchmark. Sharing the experience in designing and implementing financing mechanisms/structures is critical for the field. These good practices can be replicated or adapted in other places. This will also pave for potential collaboration opportunities among actors across the world. In this respect, networks and platforms are precious for learning collaborations and improving the deal flow. Different deal structures are tested all around the world and information on the results is valuable for other parties looking into possible deal structures. Impact Terms Project has contributed significantly to the field by opening a platform where experts share their innovations, experience, and best practices. A framework approach could also help as a starting point. Decision trees that direct the user to the best suitable deal structure considering the startup's stage, industry, revenue generation capability, revenue seasonality, and other traits would be very useful (Armeni & Ferreyra de Bone, 2017).

Impact investing can be complicated and not knowing the market well and insufficient financial literacy on unconventional financing structures present significant barriers for investees in impact investing (Newmark & Pena, 2010; Phillips & Johnson, 2019; L. M. Salamon, 2014). Most often they assume they have to go to traditional venture capitalists when they need to raise financing. Accelerators and incubators may also not know new financing structures. For these reasons, raising awareness about alternative deal structures among entrepreneurs and support organizations and educating them on these alternative models would contribute to the development of the demand side of the market. Investment readiness and institutional capacity are other challenges for social enterprises, non-profits, and charities on the demand side (Nicholls & Schwartz, 2014; Phillips & Johnson, 2019). Institutional capacity is critical for investees to execute their innovative business models as well as manage complex projects, financing, and corresponding financial risks (Phillips & Johnson, 2019). The number of high-quality investments that require larger capital is limited (Wilson, 2014). Social Impact Investment Taskforce Interim Report 2019 draws attention to the need for capacity-building support to enhance the number of social enterprises that are investment-ready. Accelerators, incubators, innovations labs, higher education institution-based centers are some organizations that support impact enterprises in terms of capacity building.

Measuring social impact and quantifying performance is another challenging area for social enterprises, and they need support (Mair & Martı, 2006). Impact measurement is critical

to reflect the social and environmental value that the enterprise is creating to stakeholders and investors (Ormiston & Seymour, 2011). Once the investment products are developed, supporting tools and services need to be introduced. Financial intermediaries need to extend their services to include impact investment assets. There are rating institutions to rate assets and audit companies to audit financial statements, but nothing to rate impact and audit impact reports. Several tools are developed for investors to measure, report, and manage their investments' environmental and social impacts. As discussed above, one of these tools is the IRIS+ framework, developed by GIIN to measure and report impact. A universal method of measuring social impact for example means using the same tools, for example to measure poverty and hunger (Hadad & Găucă, 2014). Adoption and acceptance of standard metric sets in the field are critical to increasing data transparency and comparability. Developing and sharing best practices of impact management, measurement and reporting is a must.

Raising awareness among financial advisors and educating them is critical to developing the field. Impact investment market grows rapidly with new tools and assets that generate financial returns besides social and environmental returns. Most of these tools and assets were geared toward institutional and big investors, and now the market must grow to embrace retail investors. Next-generation of the wealthiest retail investors will be millennials, as there will be a significant wealth transfer, around 30 trillion dollars from baby boomers to their children (Accenture Consulting, 2015). Women are forecasted to control 75% of disposable personal income in the world by 2028 (Ernst & Young, 2016). Women and millennials care for sustainability and impact in their investment choices more than the general population (Morgan Stanley Institute for Sustainable Investing, 2019). Financial advisors are key actors to shape the portfolios of these wealthiest future retail investors and grow the marketplace. Investors state that many financial advisors are familiar with ESG mutual funds and ETF offerings, but they are not very familiar with the spectrum of assets that impact investors can use (Conway, 2019). Individual investors turn to financial advisors for guidance to allocate funds for impact investing. The biggest challenge for these investors is difficulty in accessing reliable investment advice (Rockefeller Foundation, 2019). Financial advisors need to understand social impact investing and communicate investment alternatives that are relevant to investors' aspirations. Investors may target to help a specific group, for example, disabled people or refugees. Their choice may also differ in terms of scale: some may like to invest locally, while others may be interested in national or global projects. Financial advisors have a powerful role in making sure investors choose the right products in line with their impact concerns. Aligning investments and investors' values is one thing robo-advisers are not able to do yet.

Policymakers have a crucial role in the advancement and progress of the impact investment market. Governments can help create a favorable regulatory environment and encourage more transparency for impact investing (Wilson, 2014). Several countries have passed tax relief programs for impact enterprises and special organization structures for social en-

terprises. However, more policy efforts in directing funding for innovative finance structures are needed to develop the impact capital markets. In blended finance impactful deals, risk-tolerant capital gets the first loss and is used to attract commercial capital. Governments and development institutions can also support the system by taking part in such deal structures as first-loss partners to attract private investors to the deals. On the other hand, complex deal structures increase transaction costs. Improving the facilitative and transactional infrastructure is critical to decreasing transaction costs in impact investing (Calderini et al., 2018; Schwartz et al., 2015). OECD reports that the number of blended finance deals is limited because of high costs and the required time to structure the deals. If blended finance deal structures are standardized, a higher number of enterprises can benefit from them for smaller amounts of capital.

Conclusion

The responsibilities of businesses and financial markets are questioned and the norms about their roles are changing. Consumers demand more transparency in business practices and businesses are not only held responsible for shareholders but the planet and their multiple stakeholders. On the financial market side, the quest for social and environmental impact when providing capital is gaining traction. The world's problems are challenging and neither governments nor charities or philanthropists have the resources to overcome them. Businesses and investors have an important responsibility to focus on value creation in the long run and allocate resources accordingly. Financial markets are critical in providing the financial means for solutions to the most important threats the world is facing. Impact investors are integrating environmental and social impact into investment decisions. The role of capital in society is changing, and businesses looking for capital must ensure they are creating a positive impact for society. As the number of impact investors with a track record of successful investments increases, the demand for impact investment will increase.

Traditional finance theory focuses on risk and return and a new financial model that accounts for impact is needed. Products for investors across the spectrum of risk and return must be developed to grow the impact investing market. Future research can reveal the underlying dynamics of the impact investment decision-making process. Especially empirical research on which criteria impact investors use to screen potential investees and whether they are effective would be very useful. Concerning demand for impact investments, research on whether current financial assets match social entrepreneurs' needs and business models is very valuable. Another research question to explore is what would help social entrepreneurs choose and find the best suitable financing. Moreover, the investment readiness of social impact investors and capacity building needs must be investigated. Results of such research can be used to design and develop better screening criteria and financing structures in the

field. This research can also be used to develop education and training for main actors in the ecosystem. Raising awareness among financial advisors and educating them about impact investing products is crucial to develop the impact investment marketplace. Academic research and training programs are critical for the progress of the impact investment field.

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h) Proceeding in Book Form

Parsons, O. A., Pryzwansky, W. B., Weinstein, D. J., & Wiens, A. N. (1995). Taxonomy for psychology. In J. N. Reich, H. Sands, & A. N. Wiens (Eds.), *Education and training beyond the doctoral degree: Proceedings of the American Psychological Association National Conference on Postdoctoral Education and Training in Psychology* (pp. 45–50). Washington, DC: American Psychological Association.

i) Paper Presentation

Nguyen, C. A. (2012, August). *Humor and deception in advertising: When laughter may not be the best medicine.* Paper presented at the meeting of the American Psychological Association, Orlando, FL.

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