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Authors bear responsibility for the content of their published articles.

The publication language of the journal is English.

This is a scholarly, international, peer-reviewed and open-access journal published triannually in April, August and December.

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Istanbul Business Research

RESEARCH ARTICLE

Optimal Portfolio Allocation with Elliptical and Mixed Copulas

Cemile Özgür[1] , Vedat Sarıkovanlık[2]

Abstract

This research aims to investigate the asset allocation performance of three different optimization methods commonly applied in the literature for a portfolio composed of univariate returns generated from Mixed and Elliptic copulas instead of historical data. As a result, returns of five equities traded at the BIST30 index of the Turkish Stock Market were obtained. Dynamics of the univariate return series are modelled with GARCH processes with Student-t distributed innovations. Following the marginal modelling, a five-dimensional dependence structure between the series is modelled with Elliptical and Mixed copulas. From the fitted Mixed and Elliptical copula functions, daily returns of the equities are simulated which are employed by the specified optimization methods in order to find out methodology specific optimal portfolio allocations. Performance of the constructed optimal portfolios are compared according to varying risk and reward to variability ratios yielding results especially in favor of the Mixed and Student t copulas. The main contribution of this research is to be able to fill the gap in the literature on the out-of-sample portfolio allocation performance of copula functions where there are still fewer papers compared to the dependency modelling or the in-sample portfolio allocation performance of copulas.

Keywords

Portfolio Optimization, Copula Functions, GARCH, Portfolio Performance

Introduction

Optimal allocation of scarce funds between the assets of a portfolio is a long-standing debate that Markowitz first grounds in 1952. Markowitz (1952) developed the Mean-Variance (MV) model suggesting to use of quantitative measures of risk and return in asset selection problems. Since then, there is growing literature on the applications, shortcomings, possible improvements and extensions of the model under the name Modern Portfolio Theory. Significantly, the advances in technology made it possible to overcome some of the shortcomings leading the way to further developments.

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One of the earliest criticisms of the MV model is made on the risk measure. Variance as a symmetric measure of deviations from the mean is criticized for equally penalizing upside and downside deviations. Moreover, research on the characteristics of return series showed that financial returns are leptokurtic, skewed with autocorrelation and changing variance leading to a higher occurrence of joint tail movements compared to normal distribution. If the returns are skewed with high kurtosis, then variance will not be able to correctly specify the magnitude of the losses.

In the meantime, the correlation coefficient as one of the most frequently applied linear dependency measures is criticized for not being able to model the tail co-movements of prevalent returns especially at the times of financial market boom or distress. On the other hand, Copula functions (Sklar, 1959) can model nonlinear dependence structures with extreme co-movements that can be observed on the tails of the return distributions without any restriction on the types of the marginal distributions.

Considering the above-mentioned series specific characteristics and modelling issues, this paper employs Elliptical and Mixed copulas based on Generalized Auto-Regressive Conditional Heteroskedasticity (GARCH) (Bollerslev, 1986; Engle, 1982) models to capture the dynamic structure of the univariate returns together with the multivariate dependence between the series. Compared to most of the papers that mainly use the traditional method of historical returns or return forecasts of conditional mean and/or variance models, this paper employs returns simulated from copula functions to determine optimal weights of Tangency, Global Minimum CVaR (GMCVaR) and Global Minimum Variance (GMV) portfolios for the out-of-sample period by also comparing their results with the traditional methods. Additionally, as an alternative to variance, minimum risk portfolios are obtained from Conditional Value at Risk (CVaR) measure that considers the expected value of the losses exceeding the threshold of VaR. The main contribution of this research is that there is still a small number of papers investigating performance of copula functions in the out-of-sample portfolio allocation tasks.

This paper consists of seven main sections. In Literature Review, following a brief introduction to Modern Portfolio Theory, an overview of the literature on copula functions employed in portfolio allocation context are given. The methodology of the paper is explained in the Theoretical Background section. Data and Marginal Models part of the paper introduces the data and parameter estimates of the univariate marginals. Copula Fits and Return Simulations section explains the steps employed to fit the copula functions, obtain return simulations and determine the methodology specific optimal portfolio allocations. Research findings are summarized, and the paper is concluded in the last two sections.

Literature Review

Before Harry Markowitz (1952), portfolios were constructed according to a simple/naive diversification approach that assumed a positive relation between the number of assets in a portfolio and its performance with a decreasing portfolio risk by simply adding more assets to the portfolio.

In 1952, Markowitz with his publication named "Portfolio Selection" showed that it was not possible to diversify all portfolio risk with the simple diversification approach since the co-movement of asset returns were too high. He defined variance of returns as a portfolio risk estimator and expected value of the returns as the desired property of a portfolio. As a result, for the first time a quantitative return/risk framework for asset selection was proposed. Since then, the Mean-Variance (MV) model of Harry Markowitz (1952) and its further developments named *Modern Portfolio Theory* are the standard tools frequently applied in Finance. Furthermore, William Sharpe (1964), Tobin (1958), Lintner (1965), Jensen (1969), Fama (1970), Merton and Samuelson (1974), Merton (1980), Elton, Gruber, and Padberg (1978) and others contributed to the development of the MV framework.

Nevertheless, some of the assumptions of the MV model were highly criticized. One of them was the portfolio risk measure. Variance that is a symmetric measure of deviations from the portfolio mean, was found insufficient in measuring portfolio risk. As a result, varying risk measures were proposed that consider only the downside deviations from the mean, such as Semi-variance (H. Markowitz, 1959) or only the lower tail of the return distributions such as Lower Partial Moment (LPM) (Bawa & Lindenberg, 1977), VaR (Jorion, 2000) and CVaR (Acerbi & Tasche, 2002; Uryasev, 2000). Moreover, Rockafellar and Uryasev (2000, 2002) developed an algorithm that allowed minimizing portfolio CVaR similar to minimizing portfolio variance in the MV framework. Furthermore, Patton (2004) examined the impact of skewness of univariate return series and the asymmetric dependence of the returns on portfolio allocation by constructing and comparing portfolios based on a bivariate normal distribution and copula based on more flexible distributions. Results of the study showed an improved portfolio allocation performance in terms of the investor's utility when copula functions were employed compared to the bivariate normal model.

Riccetti (2013) applied the copula-GARCH model to obtain optimal weights of commodity portfolios that maximized the expected utility of an investor in terms of the CRRA utility. The researcher compared the macro asset allocation performance of copula-GARCH, mean-variance and univariate GARCH processes. According to the results of the study, Riccetti (2013) argued that the univariate GARCH(1,1) was better at macro asset allocation of commodity portfolios compared to the copula-GARCH model. Kresta (2015) employed a Student t copula based AR(1)-GARCH(1,1) model to forecast future stock returns to find maximum

Sharpe portfolios. According to the results, optimal portfolios of the copula-GARCH model yielded higher final wealth and lower maximum drawdown values compared to the portfolios of the bootstrapping method.

Acık Kemaloglu and Kızılok Kara (2015) modelled the dependence structure of four series (two indices: BIST30, BIST100 and two exchange rates: USD, EUR) by employing four copula functions in a static and dynamic context. Among the applied static and dynamic copulas, researchers indicated that dynamic tDCC was the best to model the dependence structure of the variables. According to the results of applied portfolio optimization based on CVaR risk measure, researchers argued that investing 35% of wealth in BIST30, 30% in USD, 20% in EUR and 15% in BIST100 yields a portfolio with the minimum CVaR value. In another study, Kızılok Kara and Acık Kemaloglu (2016) modelled the dependence of EUR and USD currency returns with static and dynamic copulas to find optimum CVaR portfolios with a changing point approach. Han, Li, and Xia (2017) suggested applying robust portfolio optimization methods by modelling the dynamic structure of the return series of ten indexes with DCC copula and copula based GARCH. The results of the study that used only bivariate copula functions indicated an outperformance of Worst-Case Conditional Value at Risk with copulas (WCVaR) method in the out-of-sample period, in contrast to the in-sample period in which the static robust method had higher cumulative portfolio returns. Sahamkhadam, Stephan, and Östermark (2018) applied copula based ARMA-GARCH-EVT and GARCH-EVT for modelling conditional mean, variance and the dependence structure of ten stock indexes. From the fitted models, one day ahead returns of the indices were obtained and optimal weights for the Minimum CVaR, Global Minimum Variance (GMV) and Sharpe portfolios were determined. The performance of the portfolios was evaluated with an out-of-sample back-testing approach. According to the results, ARMA-GARCH-EVT-copula based Sharpe portfolio outperformed the benchmark portfolio in terms of cumulative portfolio wealth and elliptical copulas based GARCH-EVT models performed better at reducing portfolio risk compared to the benchmark models that were based on historical returns.

Jin and Lehnert (2018) proposed various Dynamic Conditional Elliptical copulas by extending the dynamic equicorrelation (DECO) model to copula functions. Researchers employed the proposed copulas to model the dependence structure of 89 US companies listed in a credit default swap index (CDX.NA.IG). Following the dependency modelling, they estimated VaR and expected shortfall (ES) measures of equally weighted and value-weighted portfolios. Researchers constructed optimal portfolios by applying the Mean-Variance (MV) model of Markowitz (1952) and the minimum ES optimization of Rockafellar and Uryasev (2000). Results of the research indicated the importance of marginal modelling especially for dynamic high dimensional models. Moreover, researchers argued that an improvement in portfolio risk management could be achieved by accurately modelling the dependence structure of variables and choosing an optimization method that also considered the tail risk.

On the other hand, Trabelsi and Tiwari (2019) employed GPD distribution for the tails of the marginal density functions and simulated returns from Normal and Student t copulas. Researchers used the simulated returns to find minimum CVaR portfolios and compared optimal portfolio VaR and CVaR values with the historical simulation. Results of the study showed an improved market risk estimation performance when the returns were simulated from the copula functions compared to historical simulation. In a more recent study, Yu and Liu (2021) proposed an investor specific mean-CVaR optimization model consisting of individual risk tolerance assessment. Researchers categorized individual risk tolerances based on demographic characteristics and employed a fuzzy comprehensive evaluation method to determine the investors' (individuals) risk tolerances. They modelled the univariate returns with the copula-GARCH and obtained the minimum CVaR portfolios for the given expected return thresholds determined by the investors' risk tolerance.

Theoretical Background

In this research, different types of copula functions were applied to model the dependency between five stocks and to simulate the univariate returns composing a portfolio. However, in dependency modelling with copula functions, the variables are assumed to be random independent and identically distributed. Since most of the time the return series is autocorrelated with a changing variance with respect to time, a pre-model that would be able to capture series specific patterns was necessary. For this purpose, the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model (Bollerslev, 1986; Engle, 1982) was employed. Building up on Engle (1982), Bollerslev (1986) defined GARCH(p,q) model as:

$$\varepsilon_t = \eta_t\sqrt{h_t}, \quad h_t = \omega + \sum_{j=1}^{q}\beta_j h_{t-j} + \sum_{i=1}^{p}\alpha_i\varepsilon_{t-i}^2 \tag{1}$$

where η_t is a sequence of iid random variables with zero mean and variance one. ε_t is the error term sequence and h_t is the conditional variance. When the β parameter of the conditional variance equation equals to zero, then Equation 1 would define Engle (1982)'s Autoregressive Conditional Heteroskedasticity (ARCH) model. Additionally, the parameters of ω, β and α have the positivity constraints of $\omega > 0$, $\alpha_i \geq 0$ and $\beta_j \geq 0$.

Modelling Dependence with Copulas

It was Sklar (1959) who first introduced *copula* as a multivariate function that associates (*ties*) univariate marginals of a multivariate distribution. More formally, let $F_1(x_1), \ldots, F_n(x_n)$ be the univariate marginal distribution functions and F is an n-dimensional multivariate distribution defined on R^n. The joint multivariate distribution F can be decomposed into a copula function C and its univariate marginals as:

$$F(x_1, \ldots, x_n) = C(F_1(x_1), \ldots, F_n(x_n)) \tag{2}$$

While the variables of each univariate margin are assumed to be iid, the dependence between the variables of the margins are defined by the copula C that is given by:

$$C(u_1,\ldots,u_n;\theta) = F(F_1^{-1}(u_1),\ldots,F_n^{-1}(u_n)\,) \tag{3}$$

where $u \in [0,1]^n$, θ is the copula parameter, $F_1^{-1},\ldots,F_n^{-1}$ are the quantile functions and $F_i^{-1}(u) = inf\{x: F_i(x) \geq u\}$. The density c of the copula C is obtained by:

$$c(u_1,\ldots,u_n) = \partial^n C(u_1,\ldots,u_n)/\partial u_1,\ldots,\partial u_n \tag{4}$$

Since this paper applies, Normal, Student t and a mixed copula from two copulas of the Archimedean family, a brief introduction is given in the following paragraphs. For a more detailed discussion consult the research of Joe (1997) and Nelsen (2006).

In dependency modelling, Normal (Gaussian) and Student t copulas are frequently applied copula types from the Elliptical family. Normal copula obtained from multivariate normal distribution is radially symmetric and has zero upper and lower tail dependence parameters. As a result, the co-movement of the variables when either taking very high or very low values cannot be modelled with Normal copula. For a multivariate random vector of $X = (X_1,\ldots,X_n)$, an n-dimensional Normal copula function C_N is defined by:

$$C_N(u) = \int_{-\infty}^{\phi^{-1}(u_1)}\ldots\int_{-\infty}^{\phi^{-1}(u_n)} \frac{1}{\sqrt{(2\pi)^n\,|R|}}\, exp\left(-\frac{1}{2}X^T R^{-1}X\right) dX \tag{5}$$

In Equation 5, ϕ^{-1} defines the inverse cdf of standard normal distribution, $R \in \mathbb{R}^{nxn}$ is the linear correlation matrix. On the other hand, Student t copula derived from the multivariate Student's-t distribution is also a radially symmetric copula that has positive and equal upper (UTD) and lower tail dependence (LTD) parameters. An n-dimensional Student t copula (C_t) is defined as (Demarta & McNeil, 2005):

$$C_t = \int_{-\infty}^{t_v^{-1}(u_1)}\ldots\int_{-\infty}^{t_v^{-1}(u_n)} \frac{\Gamma\left(\frac{v+n}{2}\right)}{\Gamma\left(\frac{v}{2}\right)\sqrt{(v\pi)^n|R|}} \left(1 + \frac{X^T R^{-1}X}{v}\right)^{-\frac{v+n}{2}} dX \tag{6}$$

where t_v^{-1} represents the inverse cdf of Student's-t distribution with the degrees of freedom parameter v and R is the correlation matrix.

The third copula type employed in this paper was a mixed copula which was constructed from Gumbel (Gumbel, 1960) and Clayton copulas (Clayton, 1978) with equal weights. The need for diverse asymmetric dependence structures with enhanced flexibility led the way to the development of Archimedean copulas. An *Archimedean copula* with a strict generator function φ is defined as:

$$C(u_1,u_2,\ldots,u_n) = \varphi^{-1}(\varphi(u_1) + \varphi(u_2),\ldots,\varphi(u_n)) \tag{7}$$

where φ^{-1} is the inverse of the generator function φ which is a continuous and strictly decreasing function mapped from $[0,1]$ onto $[0,+\infty)$ with the properties of $\varphi(0) = \infty$ and

$\varphi(1) = 0$. Moreover, the properties of Clayton and Gumbel copulas are summarized in Table 1 (Nelsen, 2006). Both Clayton and Gumbel copulas have tail dependence parameters only on one tail of the distribution defined either on the lower or upper tail of the distribution.

Table 1
Properties of the N-dimensional Archimedean Copulas

Copula	Definition	Generator Func./ $\varphi_\theta(t)$	LTD, UTD
Clayton	$C_\theta^{Cl}(\mathrm{u}) = [u_1^{-\theta} + \dots + u_n^{-\theta} - n + 1]^{\frac{-1}{\theta}}$	$\theta^{-1}(t^{-\theta} - 1)$	$(2^{-\frac{1}{\theta}}, 0)$
Gumbel	$C_\theta^{G}(\mathrm{u}) = exp\left[-((-\ln u_1)^\theta + \dots + (-\ln u_n)^\theta)^{1/\theta}\right]$	$(-\ln t)^\theta$	$(0, 2 - 2^{\frac{1}{\theta}})$

Mixed Copulas

Mixed Copula was proposed as a more flexible alternative to single copulas. Since a convex union of *n*-dimensional single copulas is also defined as a copula, a mixture of single copulas was suggested (Nelsen, 2006). Let $\omega = (\omega_1, \dots, \omega_j)$ be a vector of weights with $j \geq 2$ and $\omega_k \geq 0$ for all $k \in \{1, \dots, j\}$ and let $C_1, \dots, C_j$ be *n*-dimensional copulas. The *mixture* of *j* number of *n*-dimensional copulas with weight vector ω is an *n*-dimensional Mixed copula defined by:

$$C_{mix}(C_1, \dots, C_j)(u; \theta) = \sum_{k=1}^{j} \omega_k C_k(u; \theta_k), \qquad \sum_{k=1}^{j} \omega_k = 1, \quad u \in [0,1]^n \qquad (8)$$

Mixed copulas can be constructed from any of the Elliptical and Archimedean copulas. This research employed an equally weighted ($\omega_1 = \omega_2 = 0.5, j = 2$) combination of 5-dimensional Clayton and Gumbel copulas. While Clayton copula has only lower and Gumbel copula has only upper positive tail dependence parameters, constructed mixed copula has both upper and lower tail dependence with varying dependence strengths on the tails allowing for radial asymmetry.

Portfolio Optimization

This paper approached the problem of selecting the most appropriate portfolio asset combination in three different ways. First, the traditional MV model of Harry Markowitz (1952) was applied to find Global Minimum Variance Portfolios (GMVP). According to Harry Markowitz (1952), the risk of a portfolio was defined by variance and investors would prefer the smallest risk for a certain level of return. Furthermore, returns were normally distributed and there were not any transaction costs. On the other hand, *Global Minimum Variance Portfolio* (GMVP) (Merton, 1980) is also defined as one of the portfolios on the efficient frontier but among the efficient portfolios it is the one with the smallest risk level. GMVP is obtained by solving the minimization objective of:

$$\min_{w \epsilon W} \; w^T \Sigma \, w \qquad (9)$$

In Equation 9, w is the vectoral representation of the weights of returns, Σ is the covariance matrix and W is the set of feasible solutions defined by: $W = \{$for $\forall i = 1, 2, \ldots, N, \; w \in \mathbb{R}^N : \sum_{i=1}^{N} w_i = 1$ and $w_i \geq 0\}$. The set of W defines total investment and long only constraints of the optimization applied in this paper.

As a second approach, instead of variance, portfolio Conditional Value at Risk (CVaR) measure was employed as the main minimization objective of portfolio optimization which was implemented by Rockafellar and Uryasev (2000). *Global Minimum CVaR Portfolio* (GMCVaR) is defined as the portfolio with a minimum CVaR value which is on the efficient frontier constructed by mean-CVaR efficient portfolios. GMCVaR has an objective of:

$$\min_{w \in W} \; CVaR_\beta(w) \tag{10}$$

Where β is the probability level, w is the vectoral representation of the weights of returns, and W is the set of feasible solutions defined as above. According to Rockafellar and Uryasev (2000), convex GMCVaR portfolio optimization objective can be re-written as a minimization of a linear objective with respect to linear constraints such as:

$$\min_{w \in W} \; \alpha + \frac{1}{(1-\beta)N} \sum_{n=1}^{N} z_n \tag{11}$$

w.r.t. $\quad z_n \geq 0 \quad \wedge \quad w^T r_n + \alpha + z_n \geq 0 \; for \; n = 1, 2, \ldots, N \tag{12}$

where r is the vector of random portfolio returns ($r \in \mathbb{R}$), α is the minimum loss, w is the weight vector and $f(w, r_n)$ is the portfolio loss function. For the purpose to rewrite nonlinear optimization objective into a linear one, the auxiliary variables z_n are defined as $z_n \geq f(w, r_n) - \alpha$. Mean-CVaR portfolio optimization doesn't necessitate elliptically distributed portfolio returns as it is in mean-variance optimization.

Finally, the third approach applied to select optimal asset allocation was the maximum return per unit of risk portfolio or in other words *Tangency Portfolio*. It is a portfolio in the mean-variance framework of Harry Markowitz (1952) with an objective of maximizing risk free rate differenced (r_f) portfolio expected return / risk ratio which is the *Sharpe Ratio* (Sharpe, 1966, 1994). Tangency or Maximum Sharpe is a portfolio on the mean-variance efficient frontier where it is tangent to the Capital Market Line (CML). The optimization problem is defined as:

$$\max_{w \in W} \; \frac{\mu^T w - r_f}{\sqrt{w^T \Sigma w}} \tag{13}$$

In Equation 13, μ is the vectoral representation of the mean returns, Σ and w are the covariance matrix and vectoral representation of return weights, respectively. Moreover, W is the set of feasible solutions as defined previously. In this research, the risk free rate was chosen to be equal to zero, since the attitude of investors to positive portfolio returns that might be below or above risk-free rate changes significantly compared to gaining solely negative returns.

Portfolio Performance Evaluation

Outcomes of the applied optimal asset allocation methods were evaluated with risk and reward to per unit of risk-based measures. Variance, VaR and CVaR were utilized as portfolio risk measures. Portfolio specific VaR and CVaR values were estimated with the nonparametric approach. Portfolio VaR is the negative of 5th% quantile of the portfolio returns or in other words it is the 95th% quantile of the portfolio losses:

$$VaR_{5\%}(r) = -F_r^{-1}(0.05)$$ (14)

In Equation 14, F_r represents the distribution of portfolio returns (r). Portfolio CVaR is the mean value of portfolio losses that are equal to and greater than portfolio VaR value:

$$CVaR_{5\%}(r) = -E_r[r|r \leq VaR_{5\%}(r)]$$ (15)

Across applied varying portfolio optimization methodologies, the ones that minimize portfolio risk (GMV or GMCVaR portfolios) are expected to yield lower portfolio risk measures, either variance or CVaR depending on the optimization method.

Furthermore, portfolios are compared according to their reward to variability ratios or in other words risk-adjusted performance measures. From a growing number of measures, Sharpe Ratio (Sharpe, 1966, 1994) and Omega-Sharpe Ratios (Kazemi, Schneeweis, & Gupta, 2003) were employed in this paper. As defined in the previous subsection (3.3 Portfolio Optimization), the Sharpe ratio is the risk-free rate differenced portfolio expected return / portfolio standard deviation ratio. It is a well-known and commonly applied performance measure in finance literature. Nevertheless, the ratio is criticized for being inaccurate under nonnormal return distributions. On the other hand, Keating and Shadwick (2002) suggested the *Omega* measure as a probability weighted ratio of portfolio returns above and below a threshold return (τ):

$$\Omega(\tau) = \frac{\int_\tau^b [1-F(x)]dx}{\int_a^\tau F(x)dx}$$ (16)

where x is the random portfolio returns and *(a,b)* are the extreme tail (minimum and maximum) realizations of the portfolio return distribution, respectively. Moreover, $F(r) = P[x \leq r]$ is the cdf of the portfolio returns.

Later, as a modification of Omega, Kazemi et al. (2003) proposed Sharpe-Omega Ratio. First, Kazemi et al. (2003) showed that Omega equals to the ratio of the European call and European put option prices that were written on the portfolio:

$$\Omega(\tau) = \frac{\int_\tau^b [1-F(x)]dx}{\int_a^\tau F(x)dx} = \frac{\int_\tau^b (x-\tau)f(x)dx}{\int_a^\tau (\tau-x)f(x)dx} = \frac{E[max(x-\tau,0)]}{E[max(\tau-x,0)]} = \frac{C(\tau)}{P(\tau)}$$ (17)

In Equation 17, *f(x)* represents the density of portfolio returns, *C(τ)* and *P(τ)* are the undiscounted European call and Put option prices written on the portfolio. From Equation 17, Ka-

zemi et al. (2003) derived and defined the Sharpe-Omega as the ratio of the expected excess portfolio return over the value of the put option written on the portfolio:

$$Sharpe\text{-}Omega = \frac{\bar{\mu}_p - \tau}{P(\tau)} \tag{18}$$

where $\bar{\mu}_p$ is defined as the expected portfolio return, τ is the threshold or the minimum acceptable return (MAR). In this research, similar to the assumption of zero risk-free rate for the Sharpe ratio and Tangency portfolio optimization, MAR or the threshold return τ is also assumed to be zero.

Additionally, D Ratio suggested by Bacon (2008) was applied to compare the performance of the portfolios. D Ratio is defined as the ratio of the sum of portfolio negative and positive returns considering their frequency:

$$DRatio = \frac{n_d * \sum_{i=1}^{T} max(-r_i, 0)}{n_u * \sum_{i=1}^{T} max(r_i, 0)} \tag{19}$$

where r_i is the portfolio return i, T is the number of portfolio returns, n_d and n_u are the total number of returns that are below and above zero, respectively.

Final portfolio wealth values (W_f) of the optimal portfolios are also compared with an assumption of 100 base (beginning) value ($W_0 = 100$):

$$W_f = W_0 * \prod_{k=1}^{503}(1 + r_k) \tag{20}$$

In Equation 20, r_k is defined as the return of an optimal portfolio at day k of the out of sample period. So that an investor is assumed to rebalance its portfolio on a daily basis.

Data and Marginal Models

This research employed five equities traded at BIST30 Index of the Turkish Stock Market. The data consisted of 1,390 observations for the period of 19 June 2013 – 28 December 2018. Three of the five companies; BIM Birleşik Mağazalar A.Ş. (BIMAS), Türkiye Halk Bankası (HALKB) and Türk Hava Yolları (Turkish Airlines, THYAO) operate in Retail, Finance and Airline industries, respectively. The rest are Holding companies; Sabancı Holding (SAHOL) and Koç Holding (KCHOL) that operate in various industries. Daily closing prices of the stocks were obtained from BORSA Istanbul A.S. The returns were calculated by:

$$r_t = 100 * \ln(P_t/P_{t-1}) \tag{21}$$

Table 2

Descriptive Statistics

Stat / Stock	In-Sample Period (19/06/2013 - 30/12/2016)					Full Sample (19/06/2013 – 28/12/2018)				
	BIMAS	HALKB	KCHOL	SAHOL	THYAO	BIMAS	HALKB	KCHOL	SAHOL	THYAO
Mean	0.021	-0.073	0.042	-0.015	-0.054	0.054	-0.067	0.028	-0.025	0.049
Median	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Min	-7.776	-13.172	-7.026	-10.795	-13.449	-7.776	-15.387	-7.192	-10.795	-13.449
Max	7.605	13.638	8.289	8.417	10.344	7.605	13.638	8.289	8.417	10.344
SD	1.688	2.346	1.726	1.913	2.217	1.628	2.445	1.730	1.829	2.380
Skewness	-0.006	-0.346	0.062	-0.027	-0.266	0.181	-0.337	0.006	-0.167	-0.274
Kurtosis	4.909	6.886	4.963	4.732	6.567	4.940	7.214	4.696	4.785	5.377
Jarque-Bera	136.3***	580.2***	144.6***	112.3***	484.7***	227.1***	1059.6***	167.9***	192.3***	346.8***
ADF stat.	-10.40**	-9.857**	-10.54**	-10.38**	-9.13**	-11.53**	-11.49**	-11.02**	-11.39**	-10.31**
LB Q(10)	0.576	0.635	0.075	0.289	0.004	0.016	0.258	0.051	0.065	0.000
LM(5)	0.000	0.011	0.083	0.040	0.000	0.000	0.009	0.016	0.000	0.000
LM(10)	0.003	0.121	0.000	0.000	0.006	0.000	0.042	0.000	0.000	0.000

Notes: *** and ** indicate significance at 1% and %5 levels, respectively. p values of the Ljung-Box and Arch LM tests are reported.

Series specific descriptive statistics are given in Table 2. According to the obtained statistics, returns are skewed and have excess kurtosis. Applied Jarque-Bera test for normality also confirmed the violation of the normality assumption of financial return series. Moreover, plots of price, return and absolute return series of stocks are given in Figure 1.
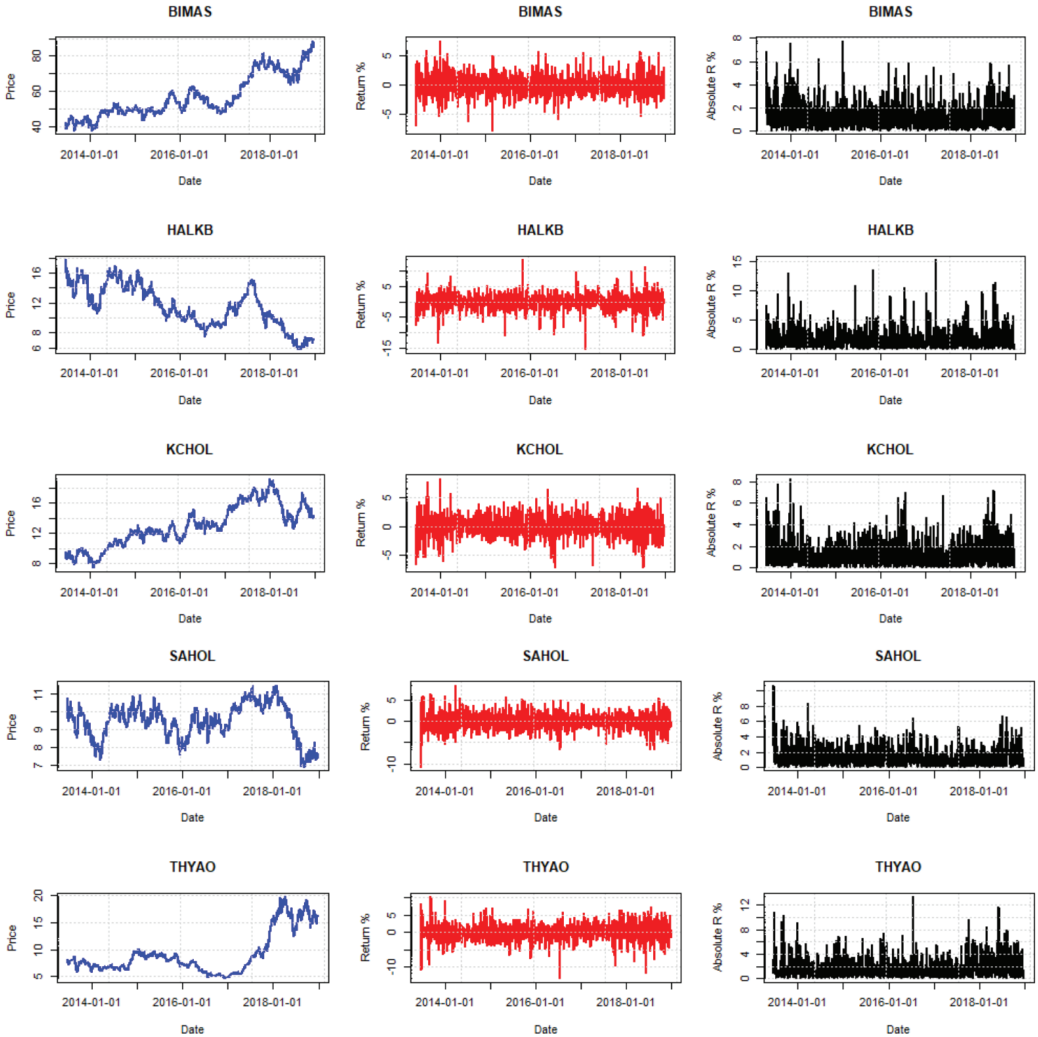
Figure 1. Plots of Price, Return and Absolute Return Series

Out of 1,390 observations spanning to five and half years, 887 of them were used for the first GARCH model parameter estimation window. GARCH(1,1) specifications with Student's t residuals efficiently captured the heteroskedastic and fat tailed return series. AR(1) was also included in a specification in case of serial autocorrelation, see THYAO in Table 3.

Table 3

GARCH(1,1) Specifications for the First Estimation Window

Return GARCH Fit	AR(1)	ω	α_1	β_1	ν	LB(12)	LM(10)
BIMAS GARCH(1,1)	-	0.212	0.073**	0.853***	5.871***	0.580	0.645
HALKB GARCH(1,1)	-	0.807	0.065	0.784***	5.057***	0.860	0.757
KCHOL GARCH(1,1)	-	0.081*	0.039**	0.933***	6.597***	0.204	0.752
SAHOL GARCH(1,1)	-	0.340	0.047**	0.856***	9.265***	0.669	0.613
THYAO AR(1)-GARCH(1,1)	-0.0735**	0.733**	0.089**	0.758***	5.163***	0.234	0.643

Notes: See the notes under Table 2. GARCH innovations are modelled with Student's t distribution.

In this research one day ahead, rolling windows approach was applied. As mentioned above, the first window included return observations from 1 to 887 and was used to simulate returns for the first day of the out-sample period consisting of 503 observations (the data starting from 888 to 1,390). The second fit window consisted of observations from 2 to 888 and was used to simulate returns for the second day of the out-sample period. One day ahead rolling windows approach was applied until simulations of the returns were obtained for every single day of the out-sample period. As a result, univariate GARCH processes given in Table 3 are re-estimated for a total of 503 windows keeping the window size constant.

Copula Fits and Return Simulations

Following the marginal modelling, pseudo-uniform variables were obtained from the standardized innovations of the GARCH filtered series. For the first window, when the scatterplots of the pseudo-uniform variables are examined (see Figure 2), it can be seen that the series are both lower and upper tail dependent with varying dependence strengths on the tails.
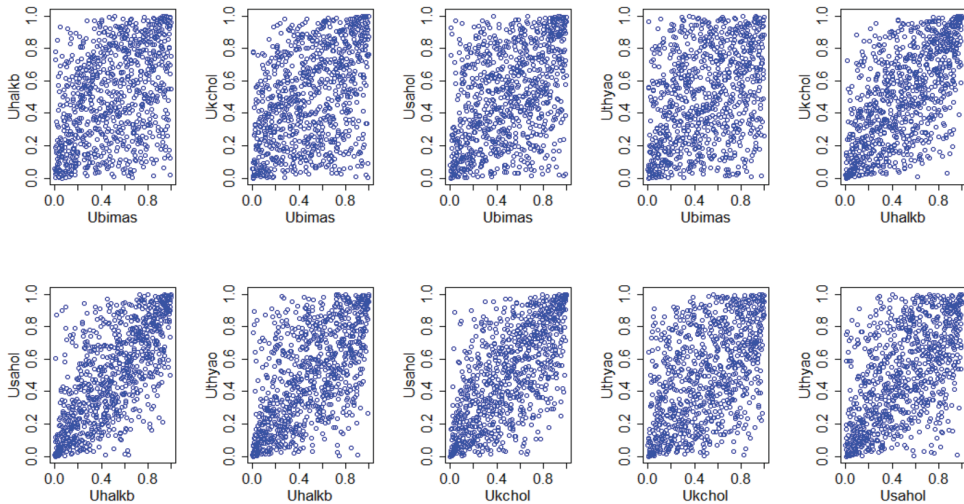
Figure 2. Scatterplots of the Pseudo-Uniform Variables of Series Obtained in First Window

Additionally, the applied multivariate Radial Symmetry Test (Genest & Nešlehová, 2014; Kojadinovic, 2017), confirmed our observation with strong evidence against radial symmetry (see also the recent work of Billio, Frattarolo, and Guégan (2022) in which a randomization based high dimensional copula radial symmetry test was proposed). Since, Student t copula is a radial symmetric copula, this finding is in favor of the mixed Clayton-Gumbel copula. Especially, if it is considered that in this research there are 503 windows in which the parameters of the copula functions were re-estimated in that case the assumption of symmetric dependence on the lower and upper parts of the multivariate distributions was not realistic.

On the next step, the parameters of Normal, Student t and the equally weighted mixture of Clayton-Gumbel copulas were estimated from the pseudo-uniform variables. For this purpose, Maximum Pseudo-Likelihood estimation method was used by employing the "Copula" package (Hofert, Kojadinovic, Maechler, & Yan, 2018) of R software (R Core Team, 2019). From the fitted copula functions, 1-day ahead returns were simulated by obtaining daily 1,000 return values for each stock. Using the daily simulated returns, optimal portfolio weights of stocks were determined by employing the three different optimization methodologies explained in the Portfolio Optimization subsection. More formally; let $u_{i,d,s}$ be pseudo-uniform variables simulated from the fitted 5-dimensional copula function. For $d=1,2,...,5$, d is the return number, $i=1,2,...,503$ is the data fit window and $s=1,...,1,000$ is the number of simulation. The estimation steps, can be summarized as follows:

- $\eta_{i,d,s} = F_{i,d}^{-1}(u_{i,d,s})$, return and window specific standardized innovations are estimated.

- One day ahead 1,000 return simulations were obtained from the window and return specific GARCH equations; $r_{i,d,s} = \eta_{i,d,s}\sqrt{h_{i,d,s}}$.

- One day ahead optimal portfolio weights were estimated using the GMV, GMCVaR and Tangency portfolio optimization models from the simulated returns. The optimization conditions included the assumptions of no transaction costs, total investment of the beginning wealth and no short selling of the assets.

- The previous steps were repeated until daily optimal portfolio weights of stocks were estimated for every single day of the out-sample period.

- Once, all the copula and optimization model specific daily optimal portfolio weights were determined, they were multiplied with the realized stock returns (the corresponding out of sample period returns) and the final model specific daily optimal portfolio returns were obtained.

Additional to the copula functions, daily optimal portfolio weights were also estimated from the historical data and univariate GARCH simulations. Furthermore, equally weighted (EWP) or in other words 1/n naive portfolio was also included in the performance evaluations, since many studies reported the outperformance of EWP.

Empirical Findings

Performance of the constructed portfolios from varying methods was compared according to the estimated reward, risk and reward to variability measures summarized in Table 4. According to Table 4, portfolio with the minimum variance measure is constructed from the daily optimal weights of Global Minimum Variance portfolios of historical returns. Since variance is a symmetric estimate, it does not correctly account for the deviations below the mean when the portfolio return distribution is not symmetric.

Table 4
Performance Measures of the Optimal Portfolios

Method	Port. Mean	Variance	VaR5%	ES5%	Sharpe Ratio	Sharpe-Omega Ratio	DRatio	Portfolio Final Wealth
EWP	0.0494	1.9775	2.4721	3.2428	0.0351	0.0963	0.8390	121.96
GMVhis	0.0639	**1.3744**	1.9577	2.5573	0.0545	0.1532	0.7726	133.19
GMCVaRhis	0.0553	1.3753	1.9223	2.5591	0.0471	0.1325	0.8385	127.58
TPhis	0.0636	2.2782	2.3800	3.4356	0.0421	0.1178	0.8035	130.02
GMVgarch	0.0458	1.5623	2.0628	2.7977	0.0367	0.1001	0.8564	121.08
GMCVaRgarch	0.0423	1.5812	2.1397	2.8684	0.0336	0.0913	0.8362	118.88
TPgarch	-0.0011	2.8372	2.8477	4.1352	-0.0006	-0.0017	0.9474	92.57
GMVnc	0.0652	1.4098	1.9568	2.5597	0.0549	0.1561	0.8020	133.95
GMCVaRnc	0.0495	1.4546	1.9840	2.7408	0.0411	0.1161	0.8308	123.68
TPnc	0.0704	3.2951	2.5263	4.0771	0.0388	0.1165	0.9137	131.11
GMVst	0.0623	1.3998	1.9524	2.5213	0.0527	0.1490	0.8199	132.07
GMCVaRst	0.0655	1.4282	**1.9034**	**2.5003**	0.0548	0.1549	0.8093	134.13
TPst	0.1682	3.6940	2.7296	4.3275	0.0875	0.2854	0.6873	212.26
GMVmixed	0.0364	1.3851	1.9421	2.5290	0.0310	0.0849	0.8964	116.01
GMCVaRmixed	0.0245	1.4063	1.9396	2.5733	0.0207	0.0560	0.8850	109.20
TPmixed	**0.1860**	3.1548	2.8132	3.9176	**0.1047**	**0.3324**	**0.6706**	**235.34**

Note: Models yielding the best measures are shown in bold. EWP is the equally weighted portfolio. Following the optimization methods (GMV, GMCVaR and TP), suffixes of -his, -garch, -nc, -st and mixed are given to indicate data type used for the optimization that are historical, GARCH simulated, Normal, Student t and Mixed copula simulated returns, respectively.

On the other hand, portfolio VaR and CVaR risk estimates take into account only the lower tail of the portfolio return distribution quantifying only the losses at and below of a given probability level. Instead of variance, if portfolio VaR and/or CVaR is considered, then the Global Minimum CVaR portfolio employing returns simulated from Student t copula based GARCH(1,1) model outperformed the rest by having the smallest portfolio risk. When the optimal portfolios are compared according to the reward to variability ratios, Tangency (max Sharpe) portfolio employing the returns simulated from the Mixed copula had the biggest Sharpe and Sharpe-Omega ratios with the lowest DRatio clearly showed that the ratios were ranked with respect to the best model. Additionally, portfolio mean, and final portfolio wealth values obtained from Student t and Mixed copula-Tangency portfolios outperformed the rest with a big difference. Time development of the portfolio cumulative wealth values of GMV, GMCVaR and Tangency portfolios are given on Figure 3 and Figure 4, respectively.
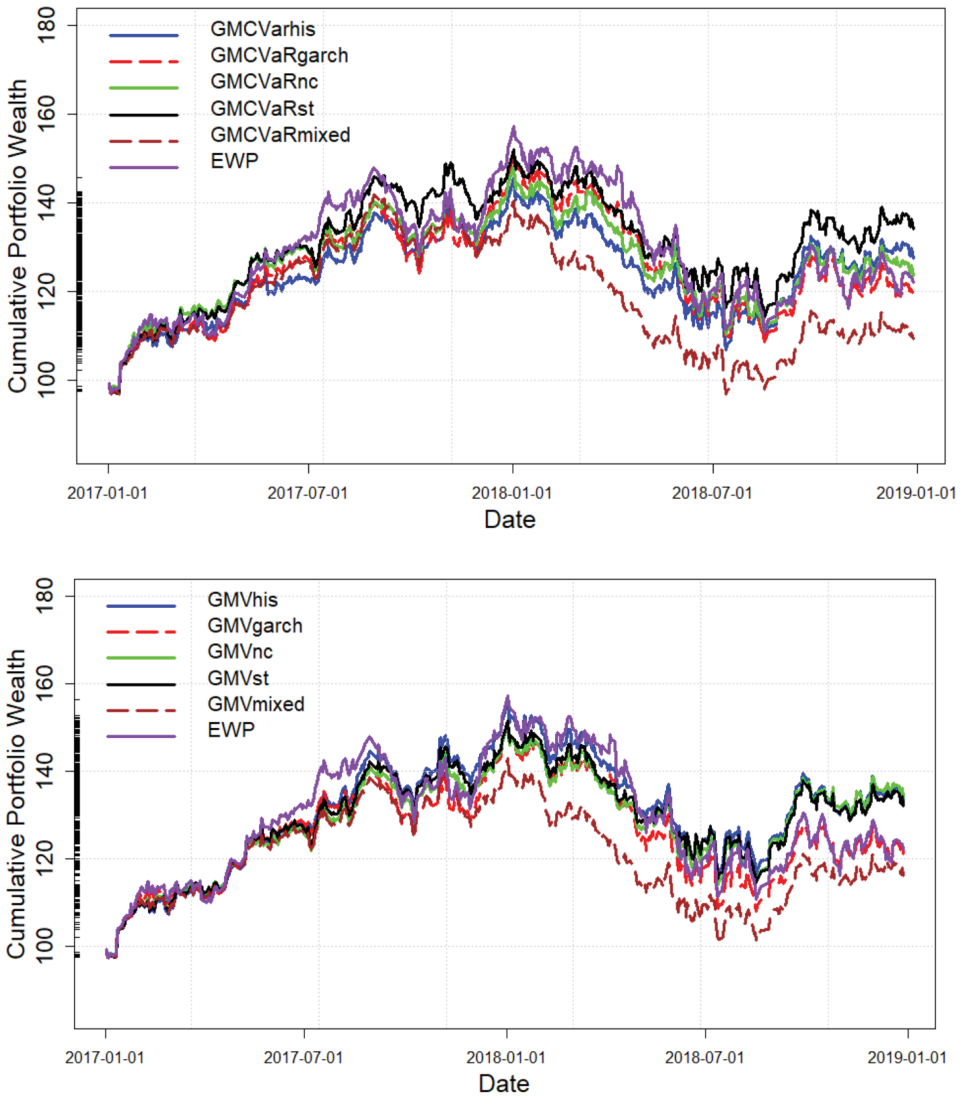
Figure 3. Time Plots of Cumulative Wealth of the GMV and GMCVaR Portfolios

From the following Figure 4, it can be seen that most of the time cumulative wealth of Student t copula-based Tangency portfolio was outperforming the rest but could not catch up the sharp rise of the Mixed copula-TP portfolio beginning in August 2018. Nevertheless, the rest of the models do not perform as well as copula-based models in terms of final portfolio wealth and reward-to-variability ratios showing the importance of tail dependence modelling. Especially, portfolios constructed with returns simulated from the univariate GARCH processes performed worst in most measures highlighting the importance of dependency modelling.
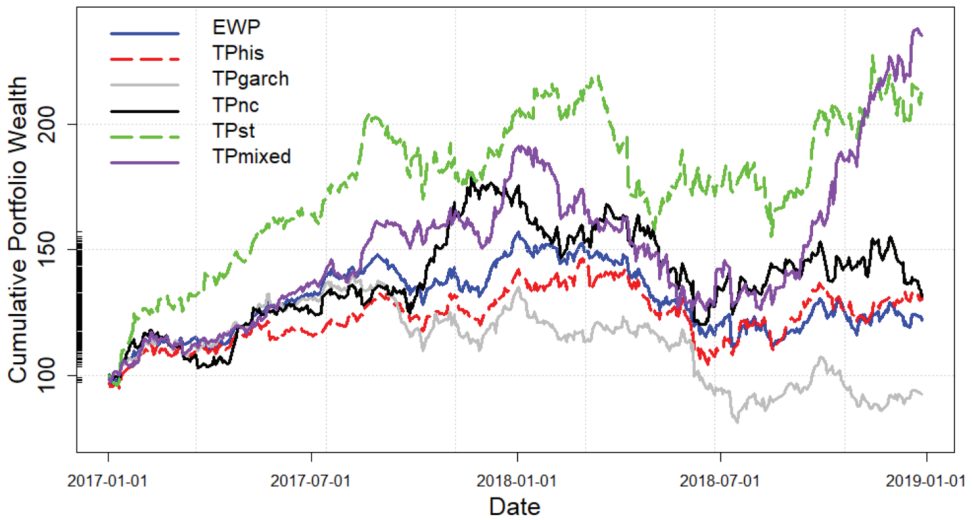
Figure 4. Time Plot of Cumulative Wealth of the Tangency Portfolios

Conclusion

This paper investigated out-of-sample performance of Normal, Student t and Clayton-Gumbel Mixed copula functions in asset allocation context with three different portfolio allocation strategies. First, optimal global minimum risk portfolios were obtained by applying Global Minimum Variance optimization method from the Mean-Variance framework. As an alternative method, optimal portfolios were constructed from Global Minimum CVaR optimization that minimizes portfolio CVaR as a risk measure instead of variance. Moreover, since the purpose of an investment is to earn the highest return relative to the per unit of risk of the investment, Tangency or maximum Sharpe portfolio optimization was employed as the third portfolio allocation strategy.

Furthermore, the performance of the copula and optimization method specific optimal portfolios were compared with the equally weighted portfolio as well as optimal portfolios constructed with GMV, GMCVaR and TP optimizations that either use historical returns or returns obtained from the univariate GARCH simulations. The results indicated that copula functions improved the out-sample asset allocation performance of the optimization models either by reducing the portfolio risk or by increasing the risk adjusted portfolio return. The usefulness of the copulas was more pronounced if extreme co-movements on the tails of the joint return distribution were more prevalent than suggested by normal distribution.

Moreover, the results of this study have the limitations of being dependent on the characteristics of the data fit and evaluation periods. The main aim of using copula functions was

to model the non-linear co-movement of assets and/or the dependence that may occur on the tails of multivariate portfolio distributions. As a result, a portfolio allocation with copula functions in periods of weaker or no co-movement between the assets and without prevalence of extreme observations might yield results in favor of the other models.

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Istanbul Business Research

RESEARCH ARTICLE

The Effect of Different Dimensions of Trust on Employee's Performance: Fuzzy Logic Model

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Abstract

This paper investigates the interaction of the dimensions of interrelated trust with the performance of employees, such as trust in the organization, trust in the manager, and trust in colleagues. In the study, a configuration perspective that evaluates social phenomena and structures with a holistic mindset was adopted while examining the effect of trust perception dimensions on the performance of employees. The researchers analyzed the relationship between variables using fuzzy logic qualitative comparison analysis (fsQCA) and collected the data through in-depth interviews and questionnaire forms. The results show that trust in colleagues plays a key role in Turkey's law enforcement officers. According to the results of this study, trusting both the manager and the institution at the same time does not increase performance. Performance improvement is related to trusting either the organization or the manager (only one of them) as well as trusted colleagues.

Keywords

Organizational Trust, Performance, Qualitative Research, Fuzzy Logic Qualitative Comparative Analysis (fsQCA)

Introduction

Transformation in the business administration environment has made trust a sought-after factor for businesses (Arı, 2003). In today's business environments, expectations are higher than ever, changes are faster than ever, and performance pressure is brutal. Many employees are having trouble achieving expected performance. Something missing? What is missing? Maybe collaboration, loyalty, trust? In this study, we present the idea that the performance problem may be a problem of trust in one aspect. As it is known, things are done with the help of people. Human relations form organizations and these relations continue with trust. Therefore, trust is highly effective in people, their work, and their performance. As Singh & Desa (2018) state, organizational trust can be a valuable factor in enhancing individual work performance in the public sector.

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Trust provides several benefits for organizations and their members (Guinot & Chiva, 2019). Trust is a social unifier allowing cooperation and coordination between members of a society or an organization to achieve common goals and high levels of efficiency (Jucevicius & Juceviciene, 2015). The concept of trust is one of the constructive and vital elements of organizational efficiency and competitive advantage (Bidarian & Jafari, 2012). There are several studies in the literature reporting that trust is associated with positive work outcomes such as job satisfaction, organizational commitment, organizational citizenship behavior, and increases task, group, and organizational performance (see: Guinot & Chiva, 2019). Usually emphasized with its psychological aspect, the concept of trust is an element that is desired, however, difficult to achieve and fragile (Seco, 2016), requiring time-consuming (Mishra & Morrissey, 1990) and dedicated efforts to bloom.

Social sciences are based on the assumption that social life is orderly. Configurational models and categories present data that may provide a basis for other social theories and studies. Therefore, it is possible to examine the effects of the dimensions of trust on the employees' performance with a configuration perspective. The concept of configuration includes the accepted structures of the multiple dimensions between the results and development of these structures. For clarity, the configuration is based on the organizational classifications derived from empirical studies on the typologies of the structures (Meyer, Tsutu, & Hinings, 1993). Configuration theory classifies similar structures in groups. Quite different from the quantitative research method, frequently used and defined as the research method for social sciences, configuration theory tries to reveal that organizational phenomena as a whole are interrelated strongly and consistently.

In the study, a configuration perspective that evaluates social phenomena and structures with a holistic mindset was adopted while examining the effect of trust perception dimensions on the performance of employees. In this context, this study investigates the impact of the dimensions of inter-related trusts on the performance of employees, such as trust in the organization, trust in the manager, and trust in colleagues, by adopting a configuration perspective. This research analyses the relationship between variables using fuzzy logic qualitative comparison analysis (fsQCA) and collects the data through in-depth interviews and questionnaire forms. For this purpose, the study first clarifies organizational trust and its dimensions and evaluates organizational trust and its dimensions in the context of the configuration approach.

Theoretical Background

Trust and Dimensions of Trust

There are different definitions of trust in the literature. For example, trust is "a psychological state comprising the intention to accept vulnerability based upon positive expectations of

the intentions or behavior of another" (Cho & Park, 2011). According to Butler (1991), trust represents the desire to be vulnerable to the actions of an individual and acceptance of the risk against uncertainty based on an evaluation of the past behavior of said individual. Organizational trust refers to the feeling of trust that all parties (managers, friends, groups) in the organization, when confronted with uncertain and risky situations, are consistent, honest, and equitable to each other, and that they will fulfill their promises (Duffy & Lilly, 2013). Unlike interpersonal trust, organizational trust is more comprehensive than trust in personal relationships, since employees base their opinions on the collective characteristics of the organization (Alfes, Shantz, & Alahakone, 2015). In this context, an organizational trust includes the employees' perceptions of the support provided by the organization and belief in the leaders' integrity and honesty, and keeping their promises, and lays the foundation for all vertical and horizontal relationships within the organization (Mishra & Morrissey, 1990). Trust may be a result of social relations. Since this perception is formed by the mutual interaction of the parties, communication becomes an important determinant in the development of organizational trust. In the formation of an atmosphere of trust, there is an increase in the vulnerability and defenselessness of the trusting person, the behavior of the trusted person is not controlled or less controlled by the trusting person than is expected (Arı, 2003).

Organizational trust, a multi-dimensional concept, is categorized into two aspects; cognitive and emotional, according to McAllister (1995). Mishra (1996) discusses trust in four dimensions: competence, openness, interest, and reliability. There are also studies categorizing trust in terms of organization, account, personality, and cognition (Wu & Tsang, 2008). In this study, the researchers handle trust in three dimensions: trust in colleagues, trust in managers, and trust in the organization concerning the work of İslamoğlu, Birsel, & Börü (2007).

Trust in the organization represents the belief that there will be support from the organization, the promises made by the organization will be kept, and that the organization will be honest (Mishra & Morrissey, 1990). Employees who find their organization reliable will voluntarily be vulnerable to actions and behaviors that they cannot control, believing that their organization will strive in their interests, or at least will not act at their disadvantage (Tüzün, 2007).

Trust in an organization enhances relationships, facilitates negotiations, reduces costs, contributes to the solution of conflicts, increases the efficiency of the organization in its achievements, creates loyalty to the organization, and plays a role in job satisfaction (Albrecht & Travaglione, 2003). When employees feel that their organization treats them correctly and fairly, they can easily accept the decisions taken by the organization because they trust their organization more (Avram, Ionescu, & Mincu, 2015). Situations that increase trust within the organization create open and predictable business environments, where employees feel free to take risks and perform better (Alfes, Shantz, & Alahakone, 2015).

Trust in the organization and trust in the manager are different but related structures (Tan & Tan, 2000). Since managers represent the organization, employees can reflect this feeling to their organizations when they trust their managers (Whitener, Brodt, Korsgaard, & Werner, 1998). In this context, trust in the organization is dependent on the relations of employees with their managers.

Since trust is the result of mutual interactions, managers need to manage this process carefully and spread the feeling of trust to employees (Starnes, Truhan, & Mccarthy, 2010). Therefore, the managers' role is undeniable in creating, sustaining, and eliminating the trust environment with their promises and actions. However, it should be acknowledged that ensuring an environment of trust is quite sophisticated from the perspective of managers. The formation of trust may be affected by various phenomena out of direct control of the parties, like their perceptions of the interacting parties' behavior (Jucevicius & Juceviciene, 2015). Consistency in behavior, honesty, sharing of control, open communication, care and attention to subordinates (Whitener et al., 1998), and providing socio-emotional support (Purba, Oostrom, Born & Molen, 2016) are some of the factors that may affect employees' trust in their managers.

Trust in colleagues may be defined as the individual's belief in the competence, fair and reliable behavior of their colleagues (Ferres, Connell, & Travaglione, 2004). An individual who trusts their colleagues is sure that their colleague will not hide necessary information, misinform, gossip about or abuse them (İslamoğlu et al., 2007). When employees trust each other, they share their ideas and feelings and make more efforts for common goals with a sense of community (Mishra & Morrissey, 1990). It is important to be able to trust colleagues, as employees' dependence on each other to achieve individual and organizational goals requires cooperation and solidarity (Mayer, Davis, & Schoorman, 1995). In a business environment where a sense of trust develops, employees can become excited about their work, focus on their tasks, and become more productive (Seco, 2016). Trust, which is a critical issue for organizations, has the potential to directly or indirectly affect performance (Akkoç & Yılmaz, 2019). Studies focusing on understanding different outcomes related to organizational trust have also confirmed a positive relationship between organizational trust and performance. (e.g. Dirks, 1999; Dirks & Ferrin, 2001; Shen & Chen, 2007; Palonski, Kahai & Yammario, 2011; Büte, 2011; Li &Tan, 2013; Chen, Hsieh & Chen, 2014; Singh & Desa, 2018).

Configurational Approach

Although it addresses the management process as a rational process, the linear model is still widely used in strategic management and organizational management (Sarvan, Arıcı, Özen, Özdemir, & İçigen, 2003). The configuration approach models organizational elements in different combinations in a system in the context of complexity. The theory provides an

opportunity to grasp the simplified aspects of intuitive typologies (Fiss, 2011) and the historical and intuitive perspective for the practitioners (Mintzberg, 1979). The configuration approach addresses the state of connections between sophisticated and multi-organizational elements, non-linear relationships, and discontinuity. At this point, the linear modelling of the configuration approach cannot be a valid and appropriate modeling approach in the field of management. The methods describing mutual causality, synergistic effect, and non-linear change are necessary to apply the theory.

Evaluation of the Trust Concept with the Perspective of the Configuration Approach

In a complex and dynamic social and technological environment, the performance of the employees is affected by social relations. This also complicates organizational structures. Within the context of the configurational approach, it is necessary to create variations using different logical methods and limitations to determine the ideal types of equifinal outcomes which may affect the organization (Doty, Glick, & Huber, 1993). One of the authors of General Systems Theory, who coined the concept of equifinality, Ludving Von Bertanlanffy (1949) defines equifinality as the principle when in open systems a final state may be reached by different initial states. Another definition of equifinality is as a set of results gathered by using set variables and innovative analyses drawn from wider resources and accounting for strong structural components, while also considering the cause and effect relationship (Lyman, 2004). Widening the horizon of the Weberian ideal type scale, the configuration approach develops mathematical models to evaluate alternative assumptions by the concept of equifinality.

The configuration created by a combination of configurational thought analyses and qualitative research tends to evaluate social phenomena and structures with a holistic point of view (Ragin, 2008: 87). Therefore, the right approach is to evaluate the effect of perceived trust of the employees with a holistic perspective including the organization, supervisor, and colleague.

Fuzzy Logic Method (Fuzzy System)

Fuzzy set and fuzzy logic refer to an approach capable of processing ideas and information outside of classical binary logic. This approach provides mathematical answers using logical analyses to statistical uncertainties. The Fuzzy-Set theory is an effective method where multi-criteria decision-making methods are used to cope with the ambiguity in decision-making mechanisms in an environment with multiple contradictory goals, complex alternatives, and uncertain criteria (Samaddar, Nargundkar, & Daley, 2006). Fuzzy set qualitative com-

parative analyses are an effective way to achieve strong and positive results in configuration (Plewa, Conduit, & Karpen, 2016). Ragin (1987) points out that focusing on assumptions, and independent variables with a significant effect on specific dependent variables should not be limited to fuzzy set comparative analyses. He mentions the presence of different ways of reaching conclusions and asymmetric conditions in his model using equifinality and causal asymmetry rather than limiting independent variables. The models created by elaborating traditional quantitative terms in qualitative terms do not provide definitive results, however, they unravel logical inferences which may be evaluated reasonably. These implications are considered probabilities, and definitive results may be reached with mathematical explanations (Zadeh, Tanaka, & Shimura, 1975: 200).

The name is derived from the theory's focus: ambiguous situations (Smithson & Verkuilen, 2006: 4). It tries to provide a special way through evaluations based on fuzzy set equifinality in organizational configurations. It provides the analysis of equifinality investigating the relative importance of every way in reaching the solution (Fiss, 2011). While this study presents its results using the fuzzy logic method, it bases its criteria of employee performances on complexity, ambiguity, and inconsistency in terms of fuzzy logic. In this context, the theory takes its name from its focus of study. However, contrary to its name, the theory elaborates on and grades fuzzy sets and allows for a clear and explicit understanding with its generalizations of trust sub-dimensions. Fuzzy logic theory designs new and different grading combinations by using ambiguity in the process of setting up data sets and drawing inferences in the relationship between objects.

Since the concept of trust cannot be measured, fuzzy set theory, which focuses on the details of the expressions of trust in daily life, is determined as an effective way as it benefits from the whole set of logical possibilities for solving difficult and complex questions and selects the best option among them.

Research Methodology

Sample and Data Collection

This study examines the influence of organizational trust on job performance by analyzing perceptions of public employees in law enforcement officials. The participants of this study are law enforcement officials working in different levels of hierarchical order

Law enforcement in Turkey (Law enforcement officials of the Turkish Republic) is the classification of law enforcement organizations according to their types.

. Most of the law enforcement forces in Turkey are affiliated with the Ministry of Internal Affairs of the Republic of Turkey. There are two types of law enforcement agencies: judicial

law enforcement and administrative law enforcement. Considering the concept of judicial and administrative law enforcement, there are three different law enforcement forces in Turkey, and these are the General Directorate of Security, the Coast Guard Command, and the Gendarmerie General Command.

The focus of the research was to measure the perception of trust in each organization and to reveal the relationship between individuals' perception of trust and their performance. The researchers carried out qualitative research with twenty people working as law enforcement officers using an in-depth interview technique and semi-structured questionnaire. They asked closed and open-ended questions to the participants.

This study conducted a literature review to determine individuals' perception of trust configurations (trust in the organization, manager, and colleagues). This research applied the organizational trust scale belonging to İslamoğlu, Birsel, & Börü (2007) while forming the interview questions. During the interviews, the researchers sometimes allowed participants to explain their thoughts and suggestions**.** The researchers took the cumulative sums of the interview questions to determine variables (the configurations). The researchers assigned the participants' scores related to their performance evaluations as performance variables.

The relationship between the performance of the employees was investigated by a qualitative comparative analysis (fuzzy set-QCA) in three trust perception configurations (trust in the organization, trust in supervisor, and trust in colleagues). The study used the Fuzzy-set Qualitative Comparative Analysis (fsQCA) research method. As a theoretical approach, the Comparative Qualitative Analysis Technique (QCA) examines sets with different qualitative characteristics to test configuration theories. The QCA uses Boolean algebra to obtain simplified expressions generating specific results (Fiss, 2007). Contrary to the regression and correlation method overlapping with the assumption of linearity, QCA considers equifinality and concurrent variables. QCA refers to scenarios that allow a system to achieve the same final state through different initial conditions and different or multiple ways (Beraha, Bingöl, Özkan-Canbolat & Szczygiel, 2018).

Comparative Qualitative Analysis associates the interactions as conditions and outcomes while presenting a framework to compare organizational configurations. It addresses the applicability of equifinality and configurations to investigate the limited diversity between them (Fiss, 2007). This study followed the recommendations of Fiss (2007) and avoided different analytic methods like interaction effects and deviation scores. It adopted the QCA method assumptions when complex causality and non-linear relationships were demanded (Ragin, 2008). This study used fuzzy-set qualitative comparative analysis to determine the relationship between employee performance and trust dimensions, trust in the organization, trust in supervisors, and trust in employees.

Results

This section of the study is intended to evaluate the inter-relatedness between perceived trust and the performance of the individuals. At this point, the study found that the individuals' perceived trust and relevant configurations may have had effects on their performance.

This study used a qualitative comparative analysis technique and determined perceived trust configurations (trust in the organization, supervisor, and colleagues) as conditions/reasons. Individual performance points were defined as oucome variables. This research determined the cause/condition variables and outcome variables concerning the in-depth interviews and surveys technique among 20 officers who work at different levels of the organization. The researchers determined the configurations of the trust variable (to organization, manager, and colleagues) with 26 items concerning trust in the organization, 40 items concerning trust in the manager, and 38 items concerning trust to colleagues (İslamoğlu et al., 2007). Then the researchers took the cumulative totals of each sub-dimension and evaluated them with a scale of 1-5. Performance points of the organization individuals are determined as outcome variables.

Comparative Qualitative Analysis also takes into account situations when there is no relationship between condition and result (negation), rather than confining itself to situations where the condition and result relationship is present. Therefore, similar results, if there are any, are also determined in the cases where the condition-result relationship is present, and when it is not (Ragin, 2006; 2008).

After collecting the data for conditions and results, they were calibrated for use in Qualitative Comparative Analysis (QCA). The calibration makes up the qualitative method of the QCA. During this section of the study, researchers determined minimum and maximum values for cross-over thresholds. These values were completely left to the initiative and priorities of the researchers while considering the theoretical background of the research, and the sample (Fiss, 2007; Ragin, 2006; Schneider & Wagemann, 2010; 2012).

The cross-over threshold value was determined as 2.5 while calibrating the conditions making up the dimensions of the trust variable. The maximum and minimum variables of trust perception configurations were determined as 5 and 1, respectively. Performance points, determined as result variables, were scaled from 0 to 5 by the relevant organization. However, according to information received from the organization, the study found that the employees needed to have at least a base 2 points to comply with the job description. Therefore, while calibrating the result variable minimum value was determined as 2 and the maximum as 5. When the corporate value of the performance score is examined, it is seen that the employees have an average of 4.5 points. The result variable was calibrated by assigning 4.5 points to a cross-over threshold value.

Performance Points Truth Table Analysis: A truth table analysis based on Qualitative Comparative Analysis (QCA). This analysis searches for results that are sufficient causal combinations. Table 1 shows the truth table analysis of the interaction of performance score and trust perception configurations.

Table 1
Performance Variable Truth Table

Trust in Organization	Trust in Employee	Trust in Supervisor	Perf. Points	Order Consistency	PRI consistency	SYM consistency
1	0	1	1	.972	0	0
0	0	0	1	.967	0	0
0	1	1	1	.916	0	0
1	1	1	0	.759	0	0

The truth table analysis lists the combinations of all possible conditions (Schneider & Wagemann, 2010). Since there are 3 configurations, in this case, the number of all possible combinations is 2^3. The researchers determined the consistency threshold as 0.8, a value expected to give reliable results according to Fiss, 2011; Rihoux & Ragin, 2009; Schneider & Wagemann, 2012. The analysis only reports case solutions over zero (Table 1).

Solution Term Recommendations for Performance: See Table 2 for solution term recommendations of Comparative Qualitative Analysis (QCA).

Table 2
Solution Term Recommendations for Performance Variable

Solution Term	Scope (raw)	Scope (unique)	Consistency
trstinempl*trstinsprv*~trstinorg	.730	.148	.916
trstinempl*~trstinsprv*trstinorg	.635	.026	.972
~trstinempl*~trstinsprv*~trstinorg	.467	.004	.967
Full Solution	.788		.915

Ragin (2006) recommends the use of raw coverage and unique coverage to assess the empirical importance of the studies. Schneider & Wagemann (2010) state that raw coverage determines the overlap between causal/conditional sets and result sets. Unique coverage, on the other hand, shows the overlapping descriptions by dividing raw coverage into categories.

Total coverage, referred to as the importance of all causal pathways, is determined as 0.788 in this study. This result shows that the causal pathways encompasses most of the results. Raw coverage of single causal/conditional pathways is 0.73 for the ***trstinempl*trstin sprv*~trstinorg*** result pathway. Unique coverage for this pathway is 0.148. For the second solution pathway recommendation, raw coverage and unique coverage results for ***trstinempl*trstinorg*~trstinsprv*** were determined as 0.635 and 0.026, respectively. Both have acceptable results. Raw coverage for value for the third pathway ***~trstinempl*~trstinspry*~trstino rg*** was 0.467 while the unique coverage value was 0.004. This solution was eliminated by the researchers since the unique coverage value is below 0.01.

Table 2 shows that the two solutions can explain the relationship between the trust perception configurations of the employees and the performance scores of the employees. The first result shows that trusting their colleagues and managers can increase their performance when the employees *do not trust* their organizations.

The Truth Table Analysis in the cases where there is no Performance Increase (Negation): The lack of a result or negation is a recommended solution pathway even if it is not a part of the hypotheses (Ragin, 2006). This section investigates the interaction of employees' trust perception configurations between the cases where there is no increase in performance. Analyses of negation cases may help in understanding the causal logic that guides positive cases, and/or produces interesting and important information by itself (Ragin & Rihoux, 2004).

Table 3
Truth Table in cases where there is no Performance Increase (Negation)

Trust in Organization	Trust in Employee	Trust in Supervisor	~Perf. points	Order Consistency	PRI consistency	SYM consistency
0	0	0	1	.995	.857	1
1	0	1	1	.993	.75	1
0	1	1	1	.963	.559	1
1	1	1	1	.849	.374	1

We determined the consistency threshold as 0.8, a value expected to give reliable results (Table 3). The analysis only reports case solutions over zero.

Solution Term Recommendations for the cases where there is no increase in performance (negation): QCA uses a "control variable" to test the reliability of the relationship between the performance variable and trust perception configurations in cases where there is no increase in performance. Three solution recommendations were found in cases where there is no increase in performance (Table 4). While the raw coverage result is 0.946 and the unique coverage result is 0.046 for one of them (trstinempl*trstinsprv), the raw coverage result is 0.938 and the unique coverage result is 0.015 for trstinempl*trstinorg. The solutions in Table 2, about the relationship between performance and perceived trust, were re-checked since the two aforementioned solutions are not the same as the solutions in Table 2. The raw coverage and unique coverage results were determined as 0.419 and 0.004, respectively, for the third solution (~trstinempl*~trstinsprv*~trstinorg) in Table 4. This result is not acceptable as a solution for the relationship between performance and perceived trust since its unique coverage value is lower than 0.01 and is the same solution as the third solution in Table 2.

Table 4
Solution term for cases where there is no performance increase (negation)

Solution Term	Scope (raw)	Scope (unique)	Consistency
trstinempl*trstinsprv	.946	.046	.786
trstinempl*cnfdinsprv	.938	.015	.845
~trstinempl*~trstinsprv*~trstinorg	.419	.004	.995
Full Solution	.988		.784

Conclusion and Limitations

This work shows that trust in colleagues played a key role in the Turkish Law Enforcement Agency when the performance and trust perceptions were associated. The study revealed employee trust is associated with the employees' performance in cases where there is no trust in the organization or trust in the manager (Table 2). Furthermore, both solutions include employee trust when the relationship between trust dimensions is examined in cases where there is no performance increase (Table 4). However, in cases where no performance increase is reported, employees either have trust in the organization or trust in the manager, along with trust in the employee (Table 4). In cases where performance and perceived trust are associated, it has been observed that the employees do not trust in one of these dimensions (trust in the organization or trust in the manager, excluding trust in colleagues) even when they have trust in the organization or trust in the manager along with employee trust.

Employees generally perceive trust in either an organization or managers. But they necessarily trust co-workers when the interaction between performance increases interrelates the perception of trust based on those working in law enforcement agencies in Turkey.. In other words, the researchers determined that the three dimensions of perception of trust have a holistic effect on the performance of the employees. Accordingly, this study concludes that the perception of trust in their colleagues has a positive effect on the performance of employees in the absence of one of the perceptions of trust in the manager or the organization. The study found out that if either trust in the organization or trust in the manager is lacking but the other is satisfied, employee trust is also included. In the cases where trust in the manager or trust in the organization is lacking, employee trust increased the employees' performance. This point distinguishes the study from other trust perception studies. This study gives an idea about the relationship between trust and job performance and shows that the job performance of those working in law enforcement may depend on the perceptions of organizational trust.

This study provides insights into the relationship between organizational trust and job performance and indicates that job performance may be dependent on organizational trust in law enforcement officials. Increasing the performance of the employees is both the duty of the manager and also one of the most needed factors. In this sense, it is obligatory to create environments that will enable employees to perform better. Trust is an important determinant in the creation of the environment in question. The findings show that combinations of different organizational trust dimensions can have different effects on the performance of employees. It seems important that managers are aware of the strength of trust and the distinction between different trust references because it has the potential to affect employees' performance.

This study uses the fsQCA method; an alternative method to linear modeling. In addition, this study, unlike other trust studies, gives importance to the knowledge of trust types and

their interaction as well as the perception of trust in organizations and managers in increasing the performance of Turkish law enforcement officers.Researching the effects of three types of trust concurrently contributes to the trust literature and provides a better understanding of how organizational trust affects employee performance.

Focusing on different types of trust instead of focusing on one type of trust in the study provides some tips on organizational trust for managers who are interested in improving employee performance. It also helps to develop realistic expectations about the effects of trust. As far as the literature, no study addresses trust and performance with the fsQCA method. Therefore, the field is open to the contribution of the studies to be carried out with the comparative qualitative analysis technique.

The current study has limitations. This study uses a sample taken from only one industry and country. Future research may expand the model to other countries and industries. Replicating the study with a more heterogeneous sample in different organizations might increase the generalizability.

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Istanbul Business Research

RESEARCH ARTICLE

The Moderating Effect of Dynamic Capabilities and Institutional Context on Internationalization of Turkish Business Groups*

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Abstract

This study aims to investigate the outward foreign direct investment (FDI) location choices of leading Turkish business groups (TBGs) regarding internationalization motives, dynamic capabilities (DC), and institutional context. The scope of the study consists of eleven multinational TBGs with FDI exceeding 100 million USD and a two-stage mixed method was used. In the qualitative methodology, person-to-person interviews and content analysis were used for determining TBGs' internationalization motives and DC. The quantitative methodology included an analyses that measured the effect of internationalization motives on location choice with the moderation of DC and institutional context. The qualitative stage results of the research suggested that TBGs act with market, resource, efficiency, and strategic asset-seeking motives. Formal institutions were effective in TBGs' internationalization, and their DC consists of marketing, internationalization, and innovation capabilities. According to the quantitative stage results, institutional context moderated the effect of dynamic capabilities between internationalization motives and location choice. The importance and originality of this study were that it explored the internationalization process of business groups (BGs) and affiliates, and it investigated the effect of DC and institutional context with a combination of quantitative and qualitative approaches.

Keywords

Business Groups, Dynamic Capabilities, Internationalization Motives, Emerging Country, Formal Institutions

Introduction

Location choice is one of the most important decisions for multinational enterprises (MNEs) and it has been studied by many researchers (Brouthers & Hennart, 2007). Internationalization motives are useful tools to develop theory in the international business (IB) field and Benito (2015) suggested that the motives for internationalization such as market-seeking, resource-seeking, efficiency-seeking, and strategic asset-seeking could be used to explain internationalization processes.

According to Dau, Randall, & Yeung (2021), business groups (BGs) had many advantages when compared to stand-alone firms. Large BGs could adapt more easily in terms of recruitment status, property rights protection, and adaptation to the law as compared to stand-alone firms. Large BGs can play role in countries' institutional development (Dau et al., 2021). Erdener & Shapiro (2005), argued that BGs in China created an important ownership advantage in the internationalization processes. Huang and Renyong (2011) also suggested that state-owned firms rather than stand-alone firms could make high investments in FDI to natural resources when seeking resources with the financial strength they had. Therefore, it was necessary to examine whether the TBGs created an ownership advantage like China.

In the strategic management literature, the study discovered a critical issue to determine how the unique characteristics of firms affected their future success under competitive conditions, and the dynamic capabilities (DC) approach was a useful tool at this point (Winter, 2003). DC was seen as one of the most critical factors for emerging countries (ECs) MNEs to be successful. Especially if you invested in ECs, your DC could not be easily imitated because of changing economic conditions of the ECs and the contribution of DC to performance in ECs was more effective than developed countries (Fainshmidt, Pezeshkan, Frazier, Nair, & Markowski, 2016).

There were still unanswered questions on location choices, so it was necessary to increase studies done about location choice in the field of IB (Brouthers & Hennart, 2007). In other words, it was necessary to reveal the motives that affected internationalization decisions on location choices towards developed or ECs (Benito, 2015). This study examined how Dunning's (1998) motives of market-seeking, resource-seeking, efficiency-seeking, and strategic asset-seeking affected the location choices of ECs MNEs.

MNEs' DC would succeed by overcoming institutional distances between the home and host country. As stated by Dunning & Lundan (2010), the institutional context was not sufficiently emphasized in studies about DC and MNEs. Especially, institutions were defined as constraints that shaped the interaction between people (North, 1990), and they should be examined in studies on the DC approach in IB literature. The aim of this study was to investigate the outward FDI location choices of leading TBGs in the context of internationalization motives, DC, and institutional distance.

Aguilera, Crespí-Cladera, Infantes, & Pascual-Fuster (2020) argued that studies conducted at the level of BGs and their affiliates, that used primary-secondary data sources, and both qualitative-quantitative research designs in BGs literature were limited. In the qualitative aspect of this study, content analysis was conducted at two levels according to semi-structured interviews and documentation. In the quantitative aspect of the study, some primary data was obtained from the qualitative stage and some other secondary data was integrated. Then, regression analyses were performed with the Process Macro application developed by Hayes

(2018) and visualized with slope charts moderator effects. Due to these reasons, this study distinguishes itself from other studies and provides a theoretical contribution by integrating internationalization theories, DC, and institutional context on the axis of leading TBGs.

Theory and Hypotheses

When the accident elements affecting the location decisions of MNEs were examined, internationalization motives were essential elements (Ramachandran, Clark, Mclver, & Miller, 2011: 155-156). In the 1970s and early 1980s, internationalization motives were defined as market-seeking, resource-seeking, and efficiency-seeking (Erdener & Shapiro, 2005). In the 1990s, with Dunning's (1998) revision in which he expanded the ownership advantage, the strategic assets-seeking motive became one of the fundamental dimensions of internationalization motives. In this context, the motives that pushed firms to internationalize occurred in the direction of asset exploitation or asset-seeking (Child & Rodrigues, 2005: 396). In other words, while firms with various advantages wanted to use their assets in areas where they could spread these advantages, they preferred ECs with asset-exploitation motives. Firms that did not have these advantages often moved towards developed countries in search of assets that would give them competitiveness with asset-seeking motives.

With the increasing number of FDI originating from ECs, the need for research in this field also emerged rapidly. In numerous studies, it was claimed that the number of studies on FDI decisions of enterprises that internationalize from ECs to foreign markets compared to outward FDI from developed countries, was limited (Álvarez & Marín, 2010; Egan, 2013). Although developed countries offered more stable and reliable economic conditions, growth opportunities in ECs were attractive factors for MNEs. There was a rapid economic development and liberalization process in ECs, which were highly dynamic and heterogeneous. The fact was that the markets in emerging economies had development opportunities for MNEs operating there (Ngo, Bucic, Sinha, & Lu, 2019).

MNEs needed strategic capabilities to overcome the disadvantages they encountered in foreign markets they newly entered. The distribution of these critical capabilities required for MNEs was not homogeneous in every country. While it provided strategic capability, efficiency, and effectiveness in one country, it might not be in another (Luo, 2000: 359). In the literature on DC, it was argued that one of the most important reasons for success in the international arena and achieving competitive advantage for MNEs was their DC (Griffith and Harvey, 2001: 598). All these conditions caused MNEs to focus on internationalization and developing DC (Ngo et al., 2019). The DC approach, which was based on a resource-based view, was a subject that was frequently examined at the level of MNEs and their subsidiaries in international business literature (Luo, 2000; Teece, 2009; Chakrabarty & Wang, 2012; Michailova & Zhan, 2015).

According to Dunning & Lundan (2010), the constraints faced by MNEs in different institutional and economic environments created opportunities for MNEs to develop DC. The authors argued that institutional differences between the home country and host countries, and the difficulty in overcoming these differences, could cause MNEs to develop their DC. For this reason, the effects of institutions should be taken into consideration in research on DC (Dunning & Lundan, 2010). Especially in the context of the asset-exploitation motives, MNEs acted with their ownership advantages, and high institutional distance increased the efficiency of DC. According to Stevens & Shenkar (2012), institutional adaptation was of key importance for MNEs that remained between different institutional environments, and they were expected to develop various skills like DC.

ECs MNEs in a low corporate context formed BGs to overcome product, labor market and capital market challenges gained competitive advantage (Deilos & Henisz, 2000). While the number of studies in the field of IB related to BGs increased, a significant part of this interest belonged to ECs BGs (Douma, George, & Kabir, 2006). Despite this situation, Aguilera et al. (2020) argued that studies conducted at the level of BGs and their affiliates were below the 10 percent sample they had chosen. According to their investigation, they did not find any study using mixed methods and there were few studies that benefitted from both primary and secondary sources (2020). Therefore, the literature on BGs needed to be developed on these points, as indicated in the study of Aguilera et al. (2020).

When the institutional context in Turkey was examined, both uncertainties and incentives affected TBGs. TBGs were faced with many uncertainties due to reasons such as political instability, economic turnover, and the lack of government stability. Therefore, they formed BGs to overcome these uncertainties to reduce the risk or to increase profits (Öniş & Türem, 2002). Factors of the institutional context, which were effective in the internationalization processes of TBGs, needed to be investigated. In ECs such as Turkey, the international spread was towards countries that had similar institutions (Dau et al., 2021: 193). Similarly, Turkish MNEs were expected to act following the institutional context in the country of FDI and this caused institutional duality. To eliminate the dichotomy that arose from the differences in home and host countries' institutional environment, it was argued that MNEs should develop strategies (Hillman & Wan, 2005).

Dunning & Lundan (2010) argued that institutions should be included in the analysis of DC, as they were the main tools of the uncertainties faced by people and firms in the environment. Formal and informal institutions and their coercive instruments determined the game rules, shaped how the firm would direct its resources, and the paths it must follow while achieving its other goals. In this study, as stated by Dunning & Lundan (2010), the institutional context was discussed based on the North's (1990) frequently used definition of "institution".

MNEs began the institutional adaptation process when they performed FDI in a country that had an institutional context different from the origin country. The institutional adaptation

process could be achieved successfully through the learning activities of MNEs. When MNEs invested in a new country, many subjects such as market structure, entry barriers, industry standards, legal practices, and government rules needed to be learned. When all these issues regarding the institutional context were learned, MNEs adapted to the institutions of new countries (Perkins, 2014).

It was thought that these institutional differences, which were the biggest challenges, faced by MNEs could have an impact on strategies (Hillman & Wan, 2005). The institutional distance, which was calculated by political stability and absence of violence, regulatory quality, voice and accountability, rule of law, government effectiveness, and control of corruption, affected the affiliates' performance (Yang, 2015). Ramachandran et al. (2011) stated that institutional distance affected the strategic decisions of the firm. According to Ando & Ding (2014), institutional distance affected the competitiveness of the firms negatively. It was emphasized in numerous studies that MNEs' DC had critical importance in overcoming these problems and becoming successful (Hillman & Wan, 2005; Dunning & Lundan, 2010).

Investments made with asset-exploration motives were often seen as the acquisition of valuable brands in developed countries by MNEs of ECs. Emerging country-based firms needed strategic assets to be successful against their competitors by overcoming both being latecomers and other disadvantages with which they must deal. Emerging country-based firms often looked for opportunities for strategic assets while using the springboard to be successful (Luo & Tung, 2018). Since the asset-exploration motive was based on the search for a strategic asset, the existence of high institutional distance would not be a motivation for developing DC.

In this study, DC definitions were based on Teece (2007), who accepted DC as a skill or ability. DC consisted of various capabilities such as marketing capabilities (Hsu &Wang, 2012; Rodenbach & Brettel, 2012; Tartaglione & Formisano, 2018), internationalization capabilities (Kor & Mahoney, 2005; Filatotchev & Piesse, 2009; Chakrabarty & Wang, 2012; Pinho & Prange, 2016; Vithessonthi & Racela, 2016), and innovation capabilities (Filatotchev & Piesse, 2009; Chakrabarty & Wang, 2012; O'Cass & Sok, 2012; Singh, Oberoi & Ahuja, 2013). Marketing capabilities, which were built on market-based assets, became one of the most important drivers of firm performance in competitive global markets (Eng & Spickett-Jones, 2009). These dynamic marketing capabilities, which emerged above organizational skills, expressed the firms' efforts to understand and adapt to dynamic markets quickly (Ngo et al., 2019). In the following pages, internationalization motives are separated into sub-hypotheses (a for market-seeking, b for resource-seeking, c for efficiency-seeking). Hypotheses developed on the moderation of marketing capabilities and institutional context are as follows.

Hypothesis 1. Institutional context positively moderates the moderator effect of marketing capabilities between internationalization motives and the choice of the ECs.

Hypothesis 2. Institutional context negatively moderates the moderator effect of marketing capabilities between strategic asset-seeking motives and the choice of the developed country.

According to Zaheer (1995), MNEs needed to develop organizational and managerial skills to overcome foreignness and gain a competitive advantage against local firms. On the other hand, valuable, rare, and inimitable resources were necessary for businesses to be successful in internationalization. However, the important thing was to manage these resources efficiently by DC. DC was one of the most effective factors for the success of MNEs. Especially, MNEs originating from ECs developed DC because of the difficulties they faced in the institutional context in different foreign markets (Gölgeci & Arslan, 2014). Chittor (2009) emphasized that the internationalization capabilities of firms, which struggled with various uncertainties and differences in foreign markets, had improved. Internationalization capabilities were one of the key factors in the international success of firms and investigated in numerous studies (Filatotchev & Piesse, 2009; Pinho & Prange, 2016). It was suggested that internationalization capabilities positively affected the internationalization performance of firms (Pinho & Prange, 2016). In this context, the hypotheses developed on the moderation of internationalization capabilities and institutional context are as follows.

Hypothesis 3. Institutional context positively moderates the moderator effect of internationalization capabilities between internationalization motives and the choice of the ECs.

Hypothesis 4. Institutional context negatively moderates the moderator effect of internationalization capabilities between strategic asset-seeking motive and the choice of the developed country.

In today's changing world, innovation is extremely important. Increasing efficiency in R&D and production processes will reduce costs and enable firms to gain a competitive advantage (Ellonen, Jantunen, & Kuivalainen, 2011: 461-467). According to Pitelis and Teece (2015), empirical studies on DC and MNEs were shifting toward the innovation axis. Additionally, innovation capabilities positively affected the performance of MNEs (Ngo & O'Cass, 2012). Innovation capabilities were seen as a complement to sustainable competitive advantage (Collison & Narula, 2014). BGs used diversification strategies in different sectors with their innovation capabilities (Colpan, Hikino, & Lincoln, 2010).

According to Chakrabarty and Wang (2012: 206), R&D activities were considered one of the prominent concepts in DC literature. Innovation capabilities were simply defined as the ability to transform information and ideas into new products, processes, and systems for the benefit of firms and stakeholders (Breznik & Hisrich, 2014). As the internationalization rate of MNEs increased, firms had to meet the demands of their stakeholders and try to realize these demands with their R&D activities. R&D activities, which enabled companies to pro-

duce products that create added value, were a very important factor for innovation (Bayraktar & Tütüncü, 2022). Hypotheses developed on the moderation of innovation capabilities and institutional context are as follows.

Hypothesis 5. Institutional context positively moderates the moderator effect of innovation capabilities between internationalization motives and the choice of the ECs.

Hypothesis 6. Institutional context negatively moderates the moderator effect of innovation capabilities between strategic asset-seeking motive and the choice of the developed country.

Methodology

This study investigated the outward FDI location choices of leading TBGs regarding internationalization motives, DC, and institutional context. The sample of the study was selected from the 2014-year report titled "Foreign Investments from Turkey Continues to grow" by Vale Columbia Sustainable International Investment Center, DEİK, and Kadir Has University. The scope of the research consisted of 11 TBGs including Anadolu Group, Koç, Yıldız, Zorlu, TAV Airports, Borusan, Sabancı, Hayat, Alarko, Eczacıbaşı, Çelebi and 270 foreign affiliates of these TBGs. These TBGs could formThis group created a strong representation due to their large volumes of internationalization and their ability to manage serious investments successfully in many locations with different institutional contexts.

In this study, both qualitative and quantitative perspectives were used as a two-step mixed method (Creswell, 2009). The qualitative perspective consisted of 14 person-to-person interviews completed in 2017 and 2018 with 15 executives and a two-level content analysis of collected data. The study's quantitative perspective includes analyses evaluating the moderation effect of DC and institutional context on the relationship between internationalization motives on location choice.

Qualitative Methodology

Audio recordings of semi-structured interviews were backed up to prevent data loss. In addition, the audio recordings of all interviews and the notes taken during the interviews were documented and stored electronically. In the process of documentation, the researcher listened to the interviews several times to minimize the possibility of error, and for additional control, another researcher working in the field was asked to confirm the accuracy by listening to the interviews.

The data of *first-level content analysis* consisted of the documentation of interview recordings. Following the protocol of Weber (1990), the reliability test of coding was performed

by the SPSS 25 program. According to protocol, the standard correlation coefficient was expected to be 0.7 and above for the measurement of inter-coder reliability value (Weber, 1990). The stages of implementation of Weber's (1990) protocol are given in Table 1.

Table 1
Content Analysis Coding Protocol

1	The documents were transferred, and record units were described in the NVivo-12 software program.
2	First coders decided on the important procedures and then the codes were established.
3	Two researchers selected five TBGs and coded on this sample of TBGs.
4	The reliability analysis for the sample was performed and reliable results were found (Kappa; 0.857).
5	At this stage, the coding procedure was evaluated, and researchers agreed upon the process.
6	Due to the sample text coding results and the consensus of coders, there was no need to turn back 3rd step.
7	Two separate coders completed the coding of all text.
8	The reliability of the coding was lastly measured, and reliable results were found (Kappa: 0.859).

According to Arend & Bromiley (2009), in 70% of the studies in DC literature, there were problems in questionnaires and case studies in terms of it being subjective or not being able to get support from primary and secondary data sources. Although it was a lengthy process, qualitative studies were needed in the field of DC to overcome these problems. Only 20% of studies in the literature measured DC over long-term data (Arend & Bromiley, 2009: 84). For all of these reasons, in this study, second-level content analysis consisting of long-term data was conducted to determine BGs' DC. The data used in the *second-level content analysis* are interviews, researcher's memos, BGs' annual and sustainability reports, histories, vision, mission, values, and news from their press centers and other newspaper news, and magazine news. This data obtained over a period of five years consisted of approximately 10,000 pages of text, six video recordings, and 14 audio recordings. In the second-level content analysis, NVivo 12 program and Weber's (1990) protocol were used again. Due to the quantity of data being remarkably high at this point, approximately 10 percen of the data was tested for reliability. The results of the measure of coding reliability were found to be sufficient (Kappa: 0.832).

Quantitative Methodology

According to the qualitative level findings, the variables to be used in the qualitative level of the study were determined. These findings suggested that TBGs act with market-seeking, resource-seeking, efficiency-seeking, and strategic asset-seeking motives. Additionally, it was found that formal institutions were effective in TBGs' internationalization, and their DC consisted of marketing, internationalization, and innovation capabilities. Figure 1 shows the research model of the study.
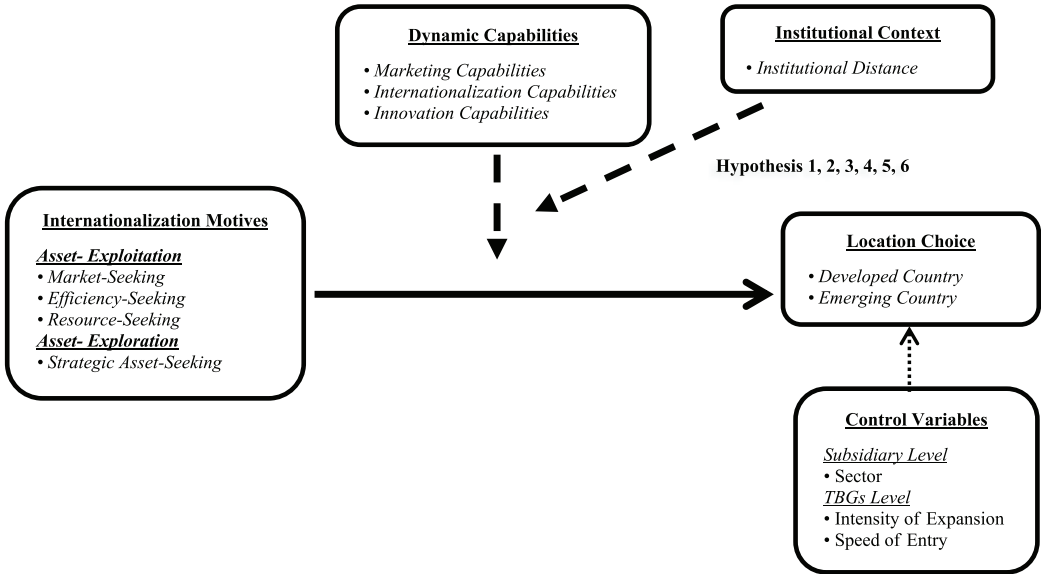
Figure 1. Research model

The Process Macro application tool developed by Hayes (2018) provided a more practical and useful analysis of mediator, moderator, and conditional effects. The analysis made by the bootstrap technique provided valid and reliable results in moderating models (Gürbüz, 2019). Process Macro Model 3 was appropriate for moderated moderation model (Isak, Bryant, & Klein, 2020). For these reasons, Process Macro Model 3 application 3.5 version was used for analyses in this study. The details of the variables, which were taken from the 2017-year data, are given in Table 2.

Findings

Qualitative Findings

Table 3 shows the codebook and key tenets of codes that were developed with the NVivo 12 program. At "Files," there is the number of files where the code was taken. At "Refer.", there is the number of references of the taken code, and "Ratio" shows the ratio of the code to total coding. The motives were ranked as market-seeking (2.72%), strategic asset-seeking (1.15%), efficiency-seeking (0.33%), and resource-seeking (0.30%). An important finding was that TBGs were more likely to seek markets and strategic assets in both emerging (3.12%) and developed (2.31%) countries. DC of TBGs consisted of internationalization capabilities (9.58%), marketing capabilities (8.74%), and innovation capabilities (7.16%), respectively. According to the findings of institutions, rather than informal institutions (0.40%), formal institutions (1.50%) came to the fore.

Table 2
Definition of Variables

Internationalization Motives	Detail	Source
• Asset-Exploitation (market, resource, efficiency-seeking) • Asset-Exploration (strategic asset-seeking)	If there is motivation, it is coded as 1 or otherwise 0	Codes from the interview and first-stage content analysis
DC		
• Marketing Capabilities (marketing development ratio)	The increase in marketing development over 3 years (Hsu & Wang, 2012)	DC which was determined from second stage content analysis, taken from TBGs' annual and financial reports as secondary data
• Internationalization Capabilities (internationalization ratio[1])	The ratio of foreign sales to total sales (Filatotchev & Piesse, 2009; Chakrabarty & Wang, 2012)	
• Innovation Capabilities (R&D intensity)	The ratio of R&D spending to total sales (Filatotchev & Piesse, 2009; Chakrabarty & Wang, 2012)	
Institutional Context		
• Voice and Accountability • Political Stability and Absence of Violence • Government Effectiveness • Regulatory Quality • Rule of Law • Control of Corruption	Kogut & Sing's (1988) process: Institutional Distance (Yang, 2015; He & Zhang, 2018; Konara & Shirodkar, 2018) $$D = \sqrt{\sum_i \frac{(I_{host,i} - I_{origin,i})^2}{V_i}}$$	The data were taken from Worldwide Governance Indicators (WGI) 2017 index
Control Variables		
•• Affiliate Level (sector)	If the sector is manufacturing, it is coded as 1 or otherwise 0	TBGs' annual reports, websites, histories
• TBGs Level — The Intensity of Expansion	The number of countries that invested at the same time	
Speed of Entry	The difference between foundation year and internationalization year	
Dependent Variable		
• Development of Country	Countries' income level from the Atlas method is taken.	World Bank

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1   In this study, internationalization capabilities are measured by the ratio of foreign sales to total sales. In addition, internationalization experience is also used in the regression analysis as a factor of internationalization capabilities. The results of the analysis showed that there is no significant difference between internationalization experience and internationalization ratio. Thus, it was decided to use the internationalization ratio in the analysis but to prevent bias findings intensity of expansion and speed of entry were taken as control variables.

Table 3
Codebook and Key Tenets

Name		Files	Refer.	Ratio	Key Tenets
Location Choice	Developed Country	147	1923	2.31	▪ In developed countries, the market is large, currencies are stable, and they have sustainability advantages. ▪ We prefer geographies that can be considered developed countries in this regard
	Emerging Country	136	1226	3.12	▪ We invest in our brands in countries such as Russia and India ▪ We focus on ECs markets instead of developed matured markets. ▪ We prefer ECs because growth is much faster there
Internationalization Motives	Market-Seeking	118	1045	2.72	▪ We are also working on new markets. ▪ Opening the brand to new markets ▪ Will grow in new markets
	Resource-Seeking	18	61	0.30	▪ It is necessary to be close to the raw material. ▪ Our industry is a resource-based structured industry. ▪ Our industry is mining and if we invest in minerals, it will be where the resources are
	Efficiency-Seeking	29	62	0.33	▪ Energy costs and raw materials are cheap here. ▪ Center of attraction without customs, VAT, corporate tax ▪ Energy prices were extremely attractive when we came to Indonesia
	Strategic-Asset Seeking	84	531	1.15	▪ This acquisition developed within the scope of its rapid growth strategy. ▪ The company will be stronger in Vienna with strategic acquisition. ▪ We will continue to do so by incorporating unique brands. ▪ The world-famous chocolate brand… acquired
DC²	Marketing Capabilities*	111	616	8.74	▪ We were awarded the "Most Reputable of the Year" award for the third time. ▪ The most admired brand was selected. ▪ The company provides the highest customer satisfaction. ▪ We are by far ahead in market share in Turkey
	Internationalization Capabilities*	91	581	9.58	▪ The company that exports to the most countries ▪ We are a serious player in Europe. ▪ One of the world's largest companies in its sector ▪ We are ranked sixth in Europe and 10th in the world. ▪ Acquiring %70 of its turnover from sales outside of Turkey
	Innovation Capabilities*	88	456	7.16	▪ Our R&D center was chosen as the second most qualified R&D center in our country. ▪ We want to be a pioneer in digital transformation. ▪ Our company, which closely follows digitalization in the industry… ▪ In the next 5 years, all our factories in the world will turn to smart manufacturing bases

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2   The file and reference numbers are the average of the subcodes of marketing, internationalization, and innovation capabilities.

Name		Files	Refer.	Ratio	Key Tenets
Institutions	**Informal Institutions**	20	48	0.40	▪ Cultures of developed countries and less developed countries can be quite different. ▪ Of course, it can make adaptation difficult in a culture we do not know at all ▪ Cultures we know… there is a facilitator side
	Formal Institutions	91	610	1.50	▪ The contract was signed between the relevant ministry and the company today ▪ Despite all protective policies ▪ This country has made a great reform in preventing corruption ▪ Legal obligations want local partners. ▪ We are subject to the decision of governments, especially on this matter
Sector	**Sector**	103	476	1.50	▪ The biggest investment is in the energy sector, with a weight of %50 ▪ We are the first and only company in the sector to produce in more than one place ▪ As you know, this sector is an employment-intensive sector ▪ We created an industry giant

Quantitative Findings

In the models with more than one moderator variable, slope charts were very descriptive and used to determine the effects of both moderators in different conditions (Aiken & West, 1991). Therefore, after the results of regressions, the slope graphs of the moderator effects of the accepted hypotheses would be given. As can be seen in Table 4, in the relationship between market-seeking and location choice, the moderator effect of institutional context and marketing capabilities was found to be significant ($p<0.05$), and H1a was supported (R^2 change=0.007; F= 6.472; $p<0.05$). In the relationship between resource-seeking and location choice, the moderator effect of institutional context and marketing capabilities was found to be significant ($p<0.01$), and the H1b was supported (R^2 change=0.029; F=28.451; $p<0,01$).

Table 4
Marketing Capabilities' Regression Results

Variables	Dependent Variable: Location Choice			
	Model-1	Model-2	Model-3	Model-4
Sector	0.042	0.010	-0.018	-0.001
Intensity of Expansion	-0.010	-0.010	-0.016	-0.024
Speed of Entry	-0.019	-0.012	-0.004	-0.004
Market-Seeking	0.017			
Resource-Seeking		0.309***		
Efficiency-Seeking			0.105	
Strategic Asset-Seeking				-0.101
Marketing Capabilities	-0.010	0.007	-0.015	0.005
Institutional Context	0.412***	0.458***	0.411***	0.415***
Market-Seeking*Marketing Capabilities	0.020			

Variables	Dependent Variable: Location Choice			
	Model-1	Model-2	Model-3	Model-4
Market-Seeking*Institutional Context	-0.028			
Marketing Capabilities*Institutional Context	0.020			
Market-Seeking*Marketing Capabilities*Institutional Context	-0.109**			
Resource-Seeking*Marketing Capabilities		0.105		
Resource-Seeking*Institutional Context		0.480***		
Marketing Capabilities*Institutional Context		0.021		
Resource-Seeking*Marketing Capabilities*Institutional Context		0.294***		
Efficiency-Seeking*Marketing Capabilities			-0.110	
Efficiency-Seeking*Institutional Context			0.037	
Marketing Capabilities*Institutional Context			-0.003	
Efficiency-Seeking*MarketingCapabilities*Institutional Context			-0.241	
Strategic Asset-Seeking*Marketing Capabilities				0.108
Strategic Asset-Seeking*Institutional Context				0.040
Marketing Capabilities*Institutional Context				0.006
Strategic Asset-Seeking*Marketing Capabilities*Institutional Context				-0.064
Constant	4.103***	4.151***	4.124***	4.108***
F	61.565***	71.492***	58.885***	59.261***
R^2	0.704	0.734	0.695	0.696

Significant at * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

According to Graph 1, when the institutional distance was high, the strength of the moderator effect of high marketing capabilities between market-seeking and choosing ECs increased ($\beta=-0.131$; $p<0.05$). Graph 2 shows that when the institutional distance was high, the strength of the moderator effect of high marketing capabilities between resource-seeking and choosing the ECs reached its highest level and even caused it to change direction ($\beta=0.511$; $p<0,01$).
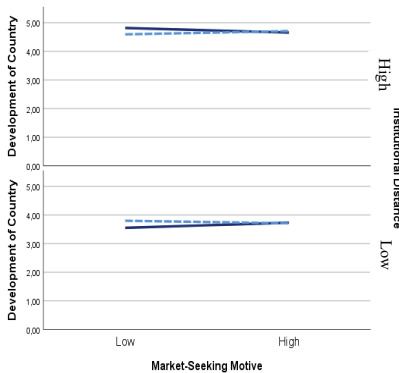
Graph 1. Market-Seeking*Marketing Cap.*Inst. Dis.
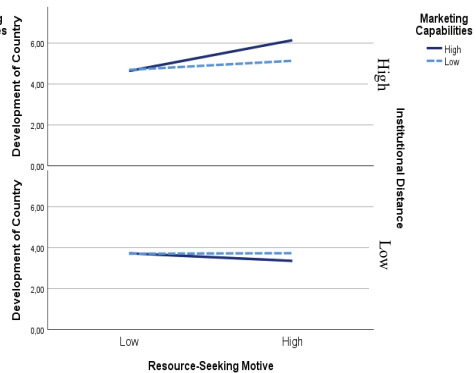
Graph 2. Resource-Seeking*Marketing Cap.*Inst. Dis.

As seen in Table 5, in the relationship between resource-seeking and location choice, the moderator effect of institutional context and internationalization capabilities was significant ($p<0.01$), and the H3b was supported (R^2 change=0.037; F=36.983; $p<0.01$). In the relationship between strategic asset-seeking and location choice, the moderator effect of institutional context and internationalization capabilities was significant ($p<0.10$). Thus, the H4 hypothesis was supported (R^2 change=0.004; F=3.287; $p<0.10$).

Table 5
Internationalization Capabilities' Regression Results

Variables	Dependent Variable: Location Choice			
	Model-1	Model-2	Model-3	Model-4
Sector	0.010	0.009	-0.027	-0.006
Intensity of Expansion	-0.008	0.015	0.008	-0.003
Speed of Entry	0.019	0.004	0.021	0.020
Market-Seeking	0.051			
Resource-Seeking		-0.092		
Efficiency-Seeking			-0.047	
Strategic Asset-Seeking				-0.048
Internationalization Capabilities	-0.018	0.052*	-0.029	-0.006
Institutional Context	0.415***	0.386***	0.413***	0.416***
Market-Seeking*Internationalization Capabilities	-0.063			
Market-Seeking*Institutional Context	-0.012			
Internationalization Capabilities*Institutional Context	0.029			
Market-Seeking*Internationalization Capabilities*Institutional Context	0.030			
Resource-Seeking*Internationalization Capabilities		0.711***		
Resource-Seeking*Institutional Context		-0.143**		
Internationalization Capabilities*Institutional Context		0.208***		
Resource-Seeking*Internationalization Capabilities*Institutional Context		1.483***		
Efficiency-Seeking*Internationalization Capabilities			0.256	
Efficiency-Seeking*Institutional Context			-0.075	
Internationalization Capabilities*Institutional Context			0.034	
Efficiency-Seeking*Internationalization Capabilities*Institutional Context			-0.173	
Strategic Asset-Seeking*Internationalization Capabilities				0.236*
Strategic Asset-Seeking*Institutional Context				0.005
Internationalization Capabilities*Institutional Context				0.017
Strategic Asset-Seeking*Internationalization Capabilities*Institutional Context				-0.189*
Constant	4.101***	4.104***	4.112***	4.113***
F	61.862***	74.950***	64.976***	62.797***
R^2	0.705	0.743	0.715	0.708

Significant at * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

According to Graph 3, when the institutional distance was high, the strength of the moderator effect of high internationalization capabilities between resource-seeking and choosing the ECs reached its highest level and even caused it to change direction ($\beta=2.759$; $p<0.01$). Graph 4 shows that when the institutional distance was low, the strength of the moderator effect of high internationalization capabilities between strategic asset-seeking and choosing the developed country was at the highest level ($\beta=0.426$; $p<0.05$).
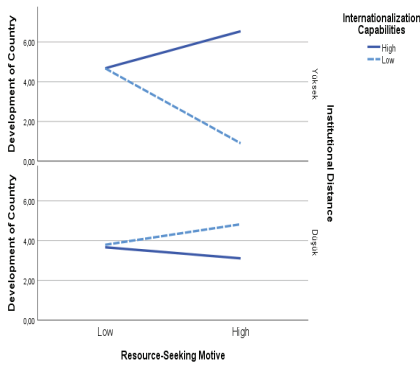
Graph 3. Resource-Seeking*Inter. Cap.*Inst. Dis.
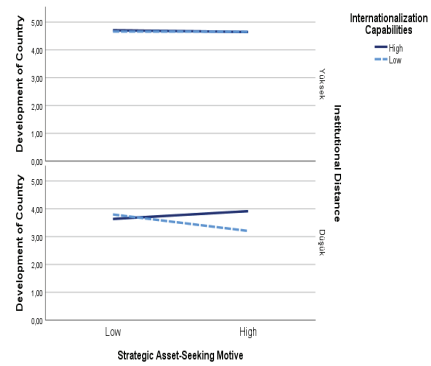
Graph 4. Strategic Asset-Seeking*Inter. Cap.*Inst. Dist.

Table 6
Innovation Capabilities' Regression Results

Variables	Dependent Variable: Location Choice			
	Model-1	Model-2	Model-3	Model-4
Sector	0.017	-0.001	-0.024	0.009
Intensity of Expansion	-0.016	-0.001	-0.006	-0.016
Speed of Entry	-0.03	-0.052**	-0.028	-0.042
Market-Seeking	0.050			
Resource-Seeking		0.356***		
Efficiency-Seeking			0.024	
Strategic Asset-Seeking				-0.020
Innovation Capabilities	0.058***	0.113***	0.047**	0.039
Institutional Context	0.400***	0.453***	0.403***	0.403***
Market-Seeking*Innovation Capabilities	0.011			
Market-Seeking*Institutional Context	-0.012			
Innovation Capabilities*Institutional Context	0.020			
Market-Seeking*Innovation Capabilities*Institutional Context	0.034			
Resource-Seeking*Innovation Capabilities		0.388***		
Resource-Seeking*Institutional Context		0564***		
Innovation Capabilities*Institutional Context		0.108***		
Resource-Seeking*Innovation Capabilities*Institutional Context		0.795***		
Efficiency-Seeking*Innovation Capabilities			0.086	
Efficiency-Seeking*Institutional Context			0.056	
Innovation Capabilities*Institutional Context			0.029	
Efficiency-Seeking*Innovation Capabilities*Institutional Context			-0.060	
Strategic Asset-Seeking*Innovation Capabilities				-0.294**
Strategic Asset-Seeking*Institutional Context				0.003
Innovation Capabilities*Institutional Context				0.058
Strategic Asset-Seeking*Innovation Capabilities*Institutional Context				0.129

Variables	Dependent Variable: Location Choice			
	Model-1	Model-2	Model-3	Model-4
Constant	4.102***	4.158***	4.113***	4.114***
F	62.005***	78.138***	62.649***	64.440***
R^2	0.705	0.751	0.708	0.713

Significant at * p<0.10, ** p<0.05, *** p<0.01.

As seen in Table 6 above, in the relationship between resource-seeking and location choice, the moderator effect of institutional context and innovation capabilities was significant (p<0.01), and the H5b was supported (R^2 change=0.046; F=47.830; p<0.01). According to Graph 5, when the institutional distance was high, the strength of the moderator effect of high innovation capabilities between resource-seeking and choosing the ECs reached its highest level and even caused it to change direction (β=1.486; p<0.01).
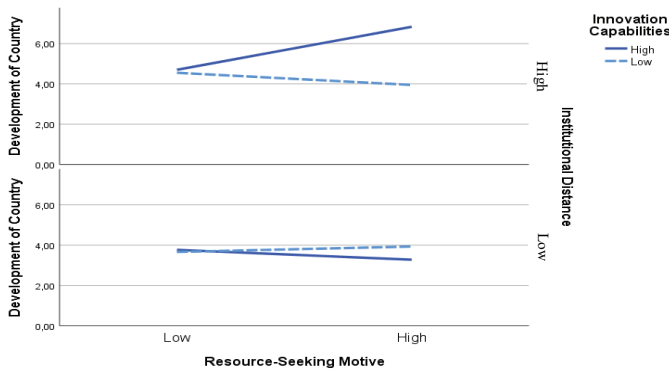
Graph 5. Resource-Seeking*Innovation Capabilities*Institutional Distance

Discussion and Limitations

Although many scholars dealt with MNEs and DC, the few studies dealing with the effect of institutions were quite limited. Claiming that DC and institutional context should be examined together, DC could be seen as a supporter of the OLI paradigm (Dunning & Lundan, 2010). At this point, especially for MNEs, it was necessary to consider the DC together with the institutional context. We investigated the outward FDI location choices of leading TBGs in the context of internationalization motives, DC, and institutional distance. We used qualitative and quantitative perspectives. Qualitative findings of the study showed that TBGs invested in both emerging and developed countries to seek markets, strategic assets, efficiencies, and resources with their internationalization, marketing, and innovation capabilities. In the internationalization process, TBGs' executives emphasized formal institutions rather than informal institutions.

As suggested by Hillman & Wan (2005) the institutional differences between the home

and host country affected MNEs, in our study's quantitative perspective, institutional distance had a moderator effect on location decisions. We supported previous research which examined outward FDI from ECs by highlighting the importance of the institutional context (Stoian, 2013). On the other hand, our study expanded previous research claiming that the institutional distance based on the definition of formal institutions by North (1990) was effective in internationalization decisions (He & Zang, 2018).

Regarding marketing capabilities, we found that when the institutional distance was high, marketing capabilities had a moderation effect with market-seeking and resource-seeking motives. MNEs acting with market-seeking motive search markets to seek new markets, protect existing markets, maintain, expand, increase their market shares, or acquire new markets. Firms that had marketing capabilities could perform these activities (Ellonen et al., 2011). In our study, it was determined that marketing capabilities were critical for firms in internationalization processes, consistent with other studies (Chakrabarty & Wang, 2012; Ripolles & Blesa, 2012). However, we had some results that differed from the previous studies. We emphasized how important marketing capabilities were in investing in ECs with high institutional distance by acting with the market-seeking motive. In our study, marketing capabilities were detected as a facilitator in investing in both developed and ECs with the resource-seeking motive.

Considering internationalization capabilities, our results showed that when the institutional distance was high, internationalization capabilities had a moderation effect with the resource-seeking motive. The moderator effect of internationalization capabilities with resource-seeking motive on location choice differed at high and low levels of institutional distance. This result could be explained by the nature of the resource-seeking motive. In some cases, investing in resources had higher costs and it might be difficult for firms. Huang & Renyong (2011) claimed that state-owned firms rather than stand-alone firms made high-cost investments when seeking resources with the financial strength they had. However, in our study, the strength of the firms came from their DC which served as a lever for location choices.

Another important finding was that when the institutional distance was low, internationalization capabilities had a moderation effect with the strategic asset-seeking motive. The presence of high institutional distance was not a motivation for the increase of the internationalization capabilities of BGs acting with a strategic asset-seeking motive. Therefore, BGs preferred more developed countries when they acted with a strategic asset-seeking motive. These results supported studies that examined the strategic asset-seeking motives of MNEs originating from ECs (Luo & Tung, 2018). Moreover, we determined that internationalization capabilities should be developed because of the difficulties of being in different institutional contexts (Chittor, 2009).

Our findings about innovation capabilities indicate that when the institutional distance

was high, innovation capabilities had a moderation effect with resource-seeking motives. These findings suggest that the moderation effect of institutional distance on the moderation of innovation capabilities seems to change the direction of the location choice. In high institutional distance conditions, BGs that had low innovation capabilities were more likely to invest in ECs while BGs that had higher innovation capabilities were more likely to invest in developed countries. In developed countries firms, DC were more widespread which gave local firms easier access to innovations (Fainshmidt et al., 2016). This may generate difficulties for firms that want to make outward FDI to developed countries. Our findings provided a further explanation of TBGs' success in investing in developed countries. Therefore, we can infer that TBGs used ownership advantage of being a BG, as Erdener & Shapiro (2005) stated. Our findings agree with studies that investigaged the effects of asset-exploitation motives in the context of the ECs (Benito, 2015; Luo & Tung, 2018) and emphasized the importance of innovation capabilities for MNEs (Michailova & Zhan, 2015; Pitelis & Teece, 2015).

Our study had some limitations. Internationalization decisions are strategic decisions, and it was not easy to reveal all the elements related to these decisions. For instance, many managers did not find it correct to explain the underlying reason for some of the FDI as to provide foreign exchange flow. Such justifications made it difficult to identify the underlying reasons for strategic decisions. Moreover, the measurement of innovation capabilities was based only on R&D intensity in this study. The sample of the study consists of BGs and their affiliates from different sectors. It was challenging to get various data from BGs such as patents, design applications, product/process innovations, innovation motivation/culture, and the quality of R&D activities from various sources. Some of this data could be found at the firm/affiliate level, and some data could be found at the BGs level. Nevertheless, R&D intensity had frequently been used as a global measure of input of innovation management (Adams, Bessant & Phelps, 2006). Thus, R&D intensity was an appropriate measure for this study.

One of the future study suggestions could be related to different measurements of capabilities in various levels of firms. Another future study could focus on the process after the choice of location. As mentioned before, although there were intense studies on the factors that affected location choice in the IB literature, studies on the process after the location selection were limited. In this direction, post-FDI integration processes could be examined. Especially, the exploitation process of DC in various locations of MNEs should be investigated or the differences in DC of BGs and their affiliates could be compared.

Conclusions and Implications

Our study has various theoretical contributions to the literature. First, we provided deeper insight into IB literature on the OLI paradigm by identifying the impact of market-seeking, resource-seeking, and strategic asset-seeking motives on the location choices with the mo-

deration of DC and institutional context. It seems that despite the high costs of resource-seeking, BGs can invest in both emerging and developed countries when they are seeking resources. In addition, resource-seeking motives came to the fore with higher marketing, internationalization, and innovation capabilities in the internationalization process.

Second, our study expanded the DC literature by highlighting the value of DC for BGs in the internationalization process. We also strengthened the previous research on the issue that DC was more effective on ECs. Our study contributed to existing knowledge of DC by suggesting evidence of the importance of marketing, internationalization, and innovation capabilities. According to this study, we inferred that marketing capabilities are likely to be more effective in investing with market-seeking motives in ECs. Besides, it could be suggested that internationalization capabilities are likely to be stronger in investing with strategic asset-seeking in developed countries. Our study has found that innovation capabilities also strengthen internationalization decisions when investing with resource-seeking motives.

Additionally, in this study, we provided a comprehensive investigation of BGs' internationalization, especially from ECs. Our study integrated the OLI paradigm, DC approach, and the institutional context on the axis of Türkiye as an example of an EC. It should be said that in the context of Türkiye, BGs might not be the best-internationalized form, but they have marketing, internationalization, and innovation capabilities to overcome the differences between home and host countries' institutional contexts. Their pioneer results could be an example for firms that have other organizational forms.

The moderator effects of DC and institutional context on location decisions, which were addressed separately in the field, were investigated together in our study. It seems that despite the institutional distance, BGs that have marketing, internationalization, and innovation capabilities can invest in both emerging and developed countries, especially when seeking resources. Furthermore, nevertheless the high institutional distance, BGs can invest in ECs while they are seeking markets through their marketing capabilities. Additionally, when BGs are seeking strategic assets, they can invest in developed countries that have lower institutional distance with their innovation capabilities.

The approach of using the moderated moderation model expanded our understanding of how internationalization decisions of BGs are shaped by the moderation effects of DC and institutional context together. We handled both BGs and affiliates levels, collected data from both primary and secondary sources, and performed both qualitative and quantitative analyses. The findings of qualitative and quantitative analyses were found to be compatible with each other. Taken together, these are the methodological contributions of our study.

The findings of this study have some practical implications. First, the evidence from our study suggested that the executives of BGs should give importance to develop DC. Additionally, we provided insights into the internationalization decisions regarding the institutional

context of home and host countries. Our study showed how important the DC of the firm are, especially at the BGs level, with the effect of ownership advantage and institutional context within the host country. This pioneering result can be an example and valuable for other organizational forms. Our findings indicated that when the institutional distance between home and host country is higher, the influence of DC is greater. Therefore, another important practical implication is that the DC of BGs can be a facilitator in terms of investing in countries with high institutional distance.

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Istanbul Business Research

RESEARCH ARTICLE

The Role of Collaborations in Successful R&D Projects

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Abstract

R&D and innovation studies often involve complex and highly uncertain tasks, which require experts to work together. This paper aims to investigate how collaboration affects the probability of success for an R&D (Research and Development) project while controlling some other factors or groups. Retrospective data of the projects managed in an R&D Centre of the Scientific and Technological Research Council of Turkey (TUBITAK) are used in the study. A generalized linear model, logit, and mixed-effect logistic regression in order to examine random effects, are implemented for the empirical analyses. In our findings, exceeding the project deadline appeared as a predictor of success in the R&D project, and collaborations' effects on R&D project success are dependent on the type of these projects. It is useful to decide on the number of collaborating institutions, depending on the project type, type of funding, and the aim of the R&D projects. Product development projects aiming at digital government or homeland security will increase their probability of success via collaboration. R&D projects with limited funds, probably have concerns about the extra costs, but as odds ratios increase against expectations, we can conclude that these projects may also benefit from collaboration.

Keywords

R&D Projects, Collaboration, Success Factors, Automated Model Selection

Introduction

R&D and innovation studies usually involve complex and highly uncertain tasks and require different expertise to work together. Sometimes, the results that can be achieved much more efficiently by a simple cooperation are obtained with much more difficulty by trying to create repetitive infrastructure and competences. Of course, it is not expected that cooperation will yield positive results in all circumstances, but it will be beneficial to investigate the effects of collaboration on project success. The main motivation of our study is to examine these collaboration dynamics among the R&D projects, having different aims or types.

Collaboration is an issue for successful innovation. Despite the complexity it brings to the projects, collaboration plays an important role in R&D and innovation. Therefore, most

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governmental R&D policies prioritize collaboration in order to maximize the benefits (e.g., "Triple Helix Model" in Etzkowitz & Leydesdorff, 1995).

It has been pointed out in various studies that benefits can be increased through collaborations, especially among complementary actors (Carayannis & Alexander, 1999; Fernandes, Araújo, Andrade, Pinto, Tereso, & Machado, 2020; Lee & Bozeman, 2005). Complex and highly uncertain tasks of R&D mostly depend on the development and integration of new knowledge and require different experts to work together on new knowledge, which are often not owned by any actor alone. This fact puts the locus of innovation in a network of inter-organizational relationships. But managing these relationships is a difficult task. There are of course benefits through accessing complementary knowledge sources, but there is also a risk of opportunistic behaviour from external partners and costs arising from the communication issues (Cassiman, Di Guardo & Valentini, 2009).

The main motivations for firms to collaborate in R&D are: expecting benefits such as sharing risks and costs of technological development (Baaken, Kesting & Gerstlberger, 2017; Bayona, García-Marco & Huerta., 2001; Carayannis & Alexander, 2004; Das & Teng, 2000; Kang & Kang, 2010), reducing the project term (Pisano, 1990), monitoring technological advances and access to new technology (Hamel, 1991), pooling resources and technological competencies (Carayannis & Alexander, 2004; Das & Teng, 2000), taking advantages of scale and overcoming entry barriers (Hagedoorn, 1993), and forming networks (Diir & Capelli 2018). The main challenges of collaboration are external (natural, political, economic, social risks), internal (strikes, production, or infrastructure problems) and network-related (interaction problems such as management, knowledge management, business processes, and collaboration issues) (Diir & Capelli, 2018).

Contributions to the literature on R&D collaboration concentrate on both theoretical explanations and empirical studies on different forms of R&D cooperation (Kleinknecht & Reijnen, 1991). Theoretical contributions are mainly from game theory (Baniak & Dubina, 2012; Binenbaum, 2008; Gong & Zhang, 2014; Katz, 1986), transaction cost economy, institutional theory, and corporate strategy (Gulati, 1995). Researchers from different theoretical perspectives applied efforts to understand when and why firms enter alliances, or the composition of an alliance (Gulati, 1995). Empirical studies usually investigate the effects of R&D collaboration on R&D success or failure, whether it is defined by product innovation (Kang & Kang, 2010), benefits (Binenbaum, 2008), partnering performance (Mishra, Chandrasekaran & Maccormack, 2015), delays or failures (Lhuillery & Pfister, 2009) or on organizational innovation (Simao & Franco, 2015).

There are conflicting results on the effects of R&D collaboration on innovation. Some research suggests a positive relationship (Aschoff & Schmidt, 2008; Belderbos, Carree & Lokshin, 2004) while others claim the opposite (Okamuro, 2007; Teng, 2006). These results

indicate that the factors which determine the effect of R&D collaboration on innovation, are complex. In some studies, the type of partners, also identified as a major factor in this relation (Belderbos et al., 2004; Fritsch & Lukas, 2001; Lhuillery & Pfister, 2009; Tether, 2002). Different partner types own different capabilities and resources, and behave in different manners in an R&D collaboration relationship. These differences affect the efficiency and the profitability of R&D collaboration.

Another focus of the previous research is on the relationship between R&D cooperation and corporate performance. Studies often conclude that R&D cooperation has positive impacts on a firm's innovation performance (Lhuillery & Pfister, 2009).

This paper aims to investigate how collaboration affects the probability of success for an R&D project while controlling some other factors. The paper is organized as follows: After a literature review on collaboration and success in R&D projects; hypotheses are developed. A generalised linear model is used for our empirical analysis. Success is measured via expert judgment, and then the model in logit form is analysed to select important variables with an automated variable selection procedure. Akaike weights and the relative importance of the variables in these sets are examined. Then, the hypotheses were tested with multi-level analyses and the resulting mixed-effect logistic regression model is bootstrapped for asymptotic assumptions' check. Finally, the potential implications are specified in the conclusion, after the discussion of the findings and the lessons learned from the study.

Collaboration and Project Success

R&D project success can be defined by a combination of subjective and objective measures, it depends on the type of innovation and is contextual (Balachandra & Friar, 1997). This lack of clarity leads to different subjective interpretations for practitioners and academics on defining project success (Smith-Doerr, Manev & Rizova, 2004).

Most commonly, a project can be considered as successful if project outputs are delivered with the expected quality on time, outcomes are realized, executed within the budget and the requirements of the stakeholders are met. As Pinto and Slevin (1987) mentioned, it is usually not explicit how to measure the project success, because of the potentially conflicting interests of stakeholders. Project success is dependent on both its success criteria and stakeholders' perception of success (Bond-Barnard, Fletcher & Steyn, 2018).

Some common success factors for R&D projects in the literature are " high-level management support", "high probability of technical success", "market existence", "availability of raw materials and technical skills", "development cost", "commitment and experience of project staff", "communication", "clearly defined project mission and objectives", "well-defined project plan", "monitoring and feedback", "congruent technology with business strategy",

"potential financial returns", "customer satisfaction", "interdisciplinary work", "supplier satisfaction" and "staying within budget constraints" (Balachandra & Friar, 1997; Belassi & Tükel 1996; Cooper & Kleinschmidt, 1995; Dwyer & Mellor, 1991; Gaynor, 1996; Griffin & Page, 1993; Maidique & Zirger, 1985; Pinto & Slevin, 1987; Smith-Doerr et al., 2004; Souder & Jenssen, 1999).

In our study, success is measured via the subjective assessment of stakeholders, which implicitly involves innovation issues.

Li, Eden, Hitt, Ireland & Garrett (2012) studied the governance decisions in R&D alliances, analysing a variance between bilateral and multilateral alliances. Their research suggested that collaborating with more partners increases the complexity of managing R&D alliances, and they found that multilateral R&D alliances are more likely to have equity-based governance structures, which are costlier. Knowledge sharing increases when the number of partners increases, but so do the concerns for knowledge leakage.

To sum up, according to the results in different studies, the effects of collaboration on project success (or innovation) may vary depending on the type of R&D, type of collaborating parties, project type, and scale of collaboration. Therefore, it is important to have a contingency approach to collaboration issues, especially for regulating bodies when promoting the collaboration of many actors in an ecosystem.

In many studies, the most common idea concerning the success of R&D projects is that it depends on numerous multi-dimensional factors (Balachandra & Friar, 1997; Cooper & Kleinschmidt, 1995; Griffin & Page, 1993; Hauser, 1998; Kerssens-van Drongelen & Bilderbeek, 1999). To overcome this, Baker, Murphy & Fisher (1983) used "perceived performance", instead of time-cost-performance measures.

Hypothesis Development

Retrospective data of the projects managed in an R&D Centre of the Scientific and Technological Research Council of Turkey (TUBITAK) are used in the study. TUBITAK is a governmental structure with no similar bodies in a developing country like Turkey. This R&D centre especially excels at multidisciplinary and novel research in several areas like informatics, e-government, defence and information security. Therefore, it can be said that choosing this institution to examine the relationship between R&D success and collaborations is the right choice in terms of representation.

The control variables and the dependent variable in this study are introduced in detail in Table 2 to investigate the potential factors which may affect the probability of success for an R&D project. For example, InFin stands for a dummy variable for the use of internal resources, Budget stands for the amount of money which the project is allowed to spend,

Expenses stands for the realized spending, BudgetUr stands for the use rate of the budget, Clscore stands for a score calculated via a checklist for project management, FBack stands for a dummy variable if the project is monitored in detail by top management, ProjSize stands for the size in terms of money.

The relation between the common success factors quoted above and the control variables in *Table 2*, and the expected direction of the correlation are shown in *Table* 1:

Table 1
Control Variables and Common Success Factors

Common success factor	Related control variable (s)	Expected direction of correlation
High-Level Management support	InFin and Budget	positive
Development cost	Expenses	negative
Staying within budget constraints	BudgetUr	positive
A well-defined project plan	Clscore	positive
Monitoring and feedback	Fback	positive

In addition to the control variables introduced above, we also included some other controls that may also affect the probability of success into the automated variable selection. These are, project type and five dummy variables (PT) representing these types, RelExp (ratio of expenses to size), four dummy variables for the aim of the project, ExTime (Extra time given to the project), SecLevel (a categorical variable for the security level of the projects), six dummy variables for the type of the funding (FT) and CollCount, which represents the number of different institutions collaborating in the project.

Like findings, which are pointing to the different effects among sectors or types, we expect a difference in the effects of collaboration, according to the type and aim of the projects.

H1: *Collaboration has different effects on the success probability of R&D projects with different project types.*

H1a: *If an R&D project is of type technology development, product development, or consultancy and service, these projects are likely to be more successful with the increasing number of collaborating institutions.*

H1b: *If an R&D project is of type feasibility or research infrastructure development, projects are likely to be more successful with the decreasing number of collaborating institutions.*

H2: *Collaboration has different effects on the success probability of R&D projects of different financial types.*

H2a: *If an R&D project is funded internationally or by a collaborative funding prog-*

ram (TARAL[1]), projects are likely to be more successful with the increasing number of collaborating institutions.

H2b: *If an R&D project is funded internally or by limited government funds, projects are likely to be more successful with the decreasing number of collaborating institutions.*

H2c: *If an R&D project is funded by a customer under a contract, the effects of collaboration cannot be predicted.*

H3: *Collaboration has different effects on the success probability of R&D projects with different aims.*

H3a: *If an R&D project is aiming to improve homeland security or social prosperity/ environment or digitalization of governmental activities, projects are likely to be more successful with the increasing number of collaborating institutions.*

H3b: *If an R&D project aiming at economic benefits, projects are likely to be more successful with decreasing number of collaborating institutions.*

Materials and Methods

Data

In this research, 170 completed R&D projects in a public R&D institution, located in Kocaeli (Turkey), were studied using their retrospective data retrieved from the institution's ERP (Enterprise Resources Planning) system, and cleansed, and then analysed as per the criteria regarding the measures of success and the characteristics of successful projects determined in the literature review. In 2015, a new ERP system was established in this institution and those 170 R&D projects were completed after 2015, and therefore, has information inside this new system. The data, which are still considered to be incomplete, were excluded from the analyses (e.g., customer satisfaction, delay, technical performance of the product, resulting technology and/or product in numbers).

While it is already difficult to define project success in general, it is more difficult in R&D projects. Therefore, the dependent variable "success" is measured by expert judgment. These judgments gathered via face-to-face and on-the-phone interviews with a 3-point-scale. Most of these experts were managers, but the main criteria to choose an expert for the interview was "remembering the subjected project well", rather than his/her position in the hierarchy. Judg-

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1   TARAL is an acronym for "Türkiye Araştırma Alanı" and most commonly used to indicate a special collaborative research funding programme of The Scientific and Technological Research Council of Turkey.

ments gathered by a three-point scale had a rather unbalanced distribution. So, the dependent variable 'ExpOpin', was re-coded as binary, by converting "Moderate" into "Unsuccessful" and resulted in a better distribution in observations (123 successful vs 47 unsuccessful with a ratio of 2.62). A generalized linear model can be used for binary variables. Since probit and logit models yield similar inferences, we chose the logit model for our empirical analysis. We model a binary outcome variable and, by definition, our data are grouped in terms of project types, aims and financial types, thus explanatory variables have random and fixed effects (Agresti, 2013). The variables and their descriptive statistics are given in Table 2.

Table 2
Variable Definitions and Descriptive Statistics

Variable	Description	Mean	Sd	Med	Min	Max	Type
ExpOpin	(Dependent variable) Subjective expert opinion about the project (0: unsuccessful, 1: successful)	2.65	0.62	3.00	1.00	3.00	Nom
ProjType	PT: R&D, Research infrastructure, Product development, Feasibility, Consulting or Service (1:5)	1.50	0.96	1.00	1.00	5.00	Nom
ClScore	A checklist score for project management: Every 1 point if there is a technical PM assistant, managerial PM assistant, Project plan.	1.13	0.93	1.00	0.00	3.00	Int
InFin	1 if the institutions' own internal financial resources are used, 0 otw	0.38	0.49	0.00	0.00	1.00	Dum
FBack	1 if another detailed tracking system is used in project management, 0 otw	0.64	0.48	1.00	0.00	1.00	Dum
RelExp	Project spending in TL divided by project size in TL	0.83	1.03	0.74	0.00	12.61	Rat
BudgetUr	Use rate for the budget, measured by (budget-spending)/budget	0.16	0.55	0.16	-3.76	1.00	Rat
AimHS	Aim; 1 if the project is for homeland security, 0 otw	0.48	0.50	0.00	0.00	1.00	Dum
AimSE	Aim; 1 if the project is for social or environmental issues, 0 otw	0.16	0.37	0.00	0.00	1.00	Dum
AimDG	Aim; 1 if the project is for digital government, 0 otw	0.21	0.41	0.00	0.00	1.00	Dum
AimEW	Aim; 1 if the project is for economic welfare, 0 otw	0.14	0.35	0.00	0.00	1.00	Dum
ProjTime	Project time in months	35.85	32.78	27.00	0.00	244.00	Int
ExTime	Extra time given for the project in months	7.05	12.08	0.00	0.00	54.00	Int
ProjSize	Financial size of the project given in TL $(x10^9)$	5033.8	10028.1	1355.0	11.0	72808.6	Int
Budget	Financials allowed to spend in the project, given in TL (000)	4373.7	8891.3	1115.5	11.0	61983.2	Int
Expenses	The amount of money spent on the project, in TL (000)	3473.6	6668.6	984.1	0.00	45634.3	Int

Variable	Description	Mean	Sd	Med	Min	Max	Type
SecLevel	The security level of the project: 3 Secret, 2: Restricted, 1: Unclassified, 0: Specific	1.65	0.74	2.00	0.00	3.00	Num
FContr	FT; 1 if the project is financed according to a contract with a customer, 0 otw	0.59	0.49	1.00	0.00	1.00	Dum
FTTaral	FT;1 if the project is financed by a public research fund, 0 otw	0.08	0.28	0.00	0.00	1.00	Dum
FTInt	FT;1 if the project is financed by international funds, 0 otw	0.04	0.20	0.00	0.00	1.00	Dum
FTPub	FT; 1 if the project is financed by a public infrastructure fund, 0 otw	0.07	0.26	0.00	0.00	1.00	Dum
FTIn	FT; 1 if the project is financed by internal funds, 0 otw	0.21	0.41	0.00	0.00	1.00	Dum
FTStSales	FT; 1 if the project has a standard product with a standard price, 0 otw	0.01	0.08	0.00	0.00	1.00	Dum
PTNPD	PT;1 if it is a product development project, 0 otw	0.61	0.49	1.00	0.00	1.00	Dum
PTTechD	PT;1 if it is a technological development project, 0 otw	0.06	0.24	0.00	0.00	1.00	Dum
PTResInf	PT;1 if it is a research infrastructure project, 0 otw	0.04	0.20	0.00	0.00	1.00	Dum
PTCons	PT; 1 if it is a consultancy or service project, 0 otw	0.26	0.44	0.00	0.00	1.00	Dum
PTFeas	PT; 1 if it is a feasibility project, 0 otw	0.03	0.17	0.00	0.00	1.00	Dum
CollCount	The number of different institutions collaborating in the project. 0: no collaboration... 3: 3 different institution (0:3)	1.51	0.81	1.00	1.00	4.00	Int

Note: $n = 170$. Aim: The aim of the Project. FT: Financial type of the Project. PT: Type of the Project. Dum: Dummy, Rat: Ratio, Int: Integer, Nom: Nominal. Sd: Standard deviation, Med: Median. otw: otherwise.

Model Selection Procedure

The model is constructed as follows, and analysed to select important variables (Correlated variables are not included in the same set):

$$log \left[\frac{P(Y = 1)}{1 - P(Y = 1)} \right] = logit\,(\pi) = \alpha + \beta_1\,x_1 + \beta_2\,x_2 + \cdots + \beta_n\,x_n$$

where, Y_j : 'ExpOpin' for project j (1 for successful, 0 for moderate and unsuccessful), $\pi = P(Y = 1)$, α: intercept, x_i: ith variable, β_i: coefficient for the effect of x_i on the probability of success ($i = 1, \dots, n$).

To avoid subjectivity, an automated variable selection procedure is preferred to decide on the model. This procedure finds the n best models among all possible models for the candidate set. Models are fitted with a generalized linear model (logit in our case) and are ranked with some information criterion (mainly Akaike Criterion (AIC) in our case). The best models

are found through exhaustive screening of the candidates. Ten different candidate sets were analysed one by one via this procedure for nearly a month. The size of the candidate sets was between 33.554.432 and 1.048.576.

Variables 'ProjSize', 'RelExp' and 'BudgetUr' were highly correlated with variables 'Budget' and 'Expenses', therefore they are not included in the same trial set. Since 'Proj-Size', 'Budget', and 'Expenses' have relatively large values, we used these variables on a logarithmic scale. A summary of the results can be found in Appendix A.

When we examine the models in detail (if we look at the top 10 models for any arbitrary set), the model weight (Akaike weights) for the best model is not substantially smaller than that of the second model. So, it is better to be doubtful about the best model in the set. To consider the variables' contributions, we plot the relative importance of the various model terms in these sets (see Figure 1) (see Appendix B for multi-model inference results -only variables with importance larger than 0.8 included):
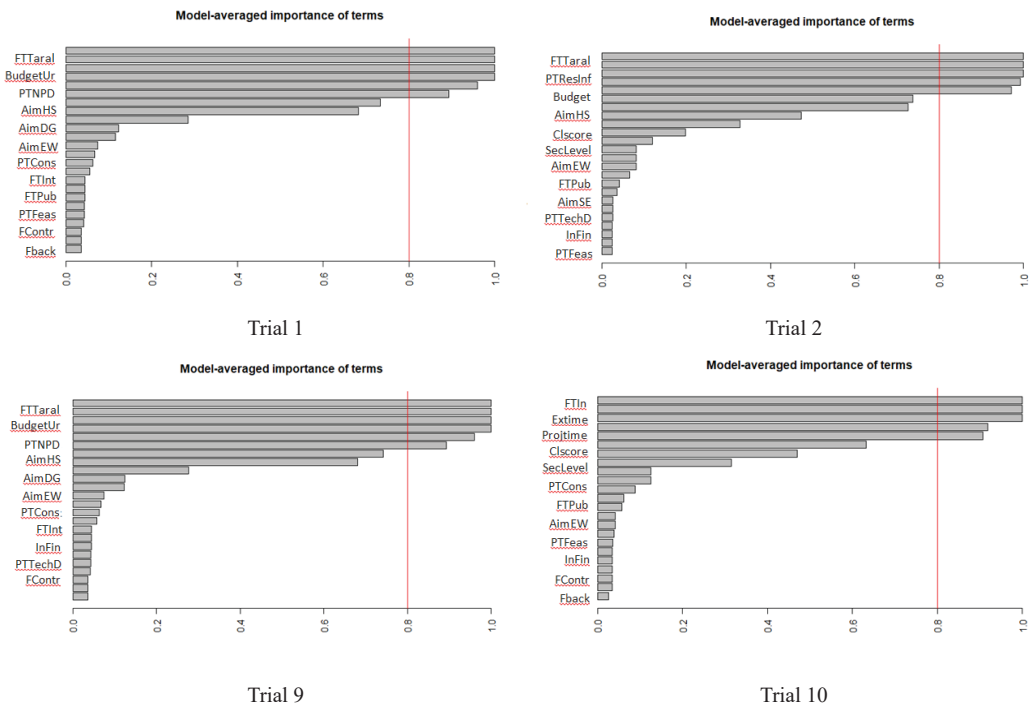
Figure 1. Importance of the variables in the selected models

A particular predictor's importance value is calculated by the sum of the weights (probabilities) for the models that contain the variable. The importance value of a variable is high if it shows up in many models with large weights. Importance values provide overall support for the variable among all candidate models (Burnham & Anderson, 2004; Anderson, 2008).

We see that most of the important variables are also in the best models, but there are differences between them. Some best models include less important variables (like ClScore or Budget). Some dummy variables, especially the ones about project types (financial type and R&D type) are included both in the best models and top variable importance lists, which showed the presence of an effect, related to the type of the project. This pointed out a random-effects model, but it is problematic to look for random effects in an automated model selection procedure. Considering the issue, we decided to select the variables that have high importance values, other than the ones related to the project type. Thus, we implemented several multi-level analyses with those project types and fitted a mixed-effect logistic regression model instead. We investigated the null model and the 7 logistic models (those include the variables "ExTime", "BudgetUr", "ProjTime" in different combinations) and chose the model, which has the least AIC value (see Table 3).

Table 3
Multiple Logistic Regression Results for Selected Variables

Variables		Null Model	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
ExTime	Est.		0.0567				0.0651	0.0600	0.0622
	p-val		0.014078 *				0.00825 **	0.01103 *	0.00960 **
BudgetUr	Est.			0.091		0.0684	0.3229		0.3610
	p-val			0.763		0.825656	0.3332		0.2790
ProjTime	Est.				-0.0018	-0.0015	-0.0040	-0.0047	
	p-val				0.726	0.7769	0.43624	0.36201	
Intercept	Est.	0.9620	0.6648	0.9481	1.0268	1.0058	0.7178	0.8168	0.5796
	p-val	<0.001 ***	0.0007 ***	<0.001 ***	<0.001 ***	0.00021 ***	0.0097 **	0.0016 **	0.0060 **
Ndev-Resdev		0	8.82	0.09	0.12	0.17	10.54	9.64	9.95
df			1	1	1	2	3	2	2
AIC		202.46	**195.64**	204.37	204.34	206.29	197.92	196.82	196.51
Correctly Predicted (Ratio)			0.7235	0.7235	0.7235	0.7235	0.7235	0.7176	0.7294
ANOVA (Type II Wald)									
ExTime	$\chi^2(1)$		6.0284				6.9780	6.4599	6.7081
	p-val		0.0141 *				0.0083**	0.0110 *	0.0096 **
BudgetUr	$\chi^2(1)$			0.0913		0.0485	0.9363		1.1718
	p-val			0.7625		0.8257	0.3332		0.2790
ProjTime	$\chi^2(1)$				0.1228	0.0803	0.6062	0.8309	
	p-val				0.7260	0.7769	0.4362	0.3620	
Hosmer and Lemeshow goodness of fit (GOF) test									
	$\chi^2(8)$		2.6897	7.8994	7.6645	13.352	7.6611	7.0825	11.713
	p-val		0.9523	0.4434	0.4669	0.1003	0.4673	0.5278	0.1645

Variables	Null Model	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Pseudo R2 (vs Model null)								
McFadden	0.0440	0.0004	0.0006	0.0008	0.0526	0.0481	0.0496
Cox & Snell (ML)	0.0506	0.0005	0.0007	0.001	0.0601	0.0551	0.0568
Nagelkerke (Cragg&Uhler)	0.0730	0.0007	0.0010	0.0014	0.0868	0.0796	0.0821
Likelihood Ratio Test								
χ^2	8.8213	0.0894	0.1207	0.1685	10.545	9.6434	9.9461
p-val	*0.0030***	*0.7649*	*0.7283*	*0.9191*	*0.0145**	*0.0081***	*0.0069***
df diff	-1	-1	-1	-2	-3	-2	-2

(.) p<0.10, ∗ p<0.05, ∗∗ p<0.01, ∗∗∗ p<0.001

Findings from Selected Models

Model 1 ($logit\,(\pi) = 0.665 + 0.0567 x_{ExTime}$) has the least AIC and the largest p-value for Hosmer (0.9523>0.05). We see that 'ExTime' has a positive effect on perceived project success ('ExpOpin') in all the models and it is the only variable that has p-values<0.05. Extra time may be a signal for great expectations for a project, so it may lead to a positive perception of success. Although there are satisfactory results for some goodness of fit tests like ANOVA (Analysis of Variance) and Hosmer, pseudo R2 values are rather small. Therefore, we investigated random effects among different project typologies. 'Type of the project'(PT_f), is the dummy code of the variables PTNPD, PTTechD, PTResInf, PTCons, PTFeas, 'Financial type of the project'(FT_f), is the dummy code of the variables FContr, FTTaral, FTInt, FTPub, FTIn, FTS, and 'Aim of the project'(Aim_f), is the dummy code of the variables AimHS, AimSE, AimDG, Aim EW. We fit a mixed-effect logistic regression to see the possible random effects of these factors, in model 8.

We then fit mixed-effect logistic regression to check our hypotheses 1, 2, and 3 for the effects of collaborations (CollCount) on project success, and the potential variability of these effects among the project types; in models 9, 10, and 11 (see Table 4). The mixed-effect models are represented as follows:

Model 8: $g(\mu_{ij}) = \alpha + \beta x_{jExTime} + u_{PT\_f} Z_{iPT\_f} + u_{FT\_f} Z_{iFT\_f} + u_{Aim\_fc} Z_{iAim\_f} + \varepsilon_{ij}$

Model 9: $g(\mu_{ij}) = \alpha + \beta x_{jExTime} + u_{0PT\_f} + u_i Z_{iCollCount} | Z_{iPT\_f} + \varepsilon_{ij}$

Model 10: $g(\mu_{ij}) = \alpha + \beta x_{jExTime} + u_{0FT\_f} + u_i Z_{iCollCount} | Z_{iFT\_f} + \varepsilon_{ij}$

Model 11: $g(\mu_{ij}) = \alpha + \beta x_{jExTime} + u_{0Aim\_f} + u_i Z_{iCollCount} | Z_{iAim\_f} + \varepsilon_{ij}$

where y_{ij} is 'ExpOpin' for the project j in category i, Z_i denotes the relevant (explanatory) random variables with random effects of u, α is for the intercept, $x_{jExTime}$ is the explanatory variable (ExTime) for project j with fixed effect β and $\mu_{ij} = E(Y_{ij}|u_i)$, whereas ε_{ij} is representing the residuals.

Table 4
Mixed Effect Logistic Regression Results

Fixed Effects		Model 8	Model 9	Model 10	Model 11
ExTime	Est.	0.0645	0.05837	0.06674	0.06346
	p-val	*0.0135 **	*0.01407 **	*0.00873 ***	*0.00956 ***
Intercept	Est.	0.3555	0.60956	0.42328	0.75652
	p-val	*0.4699*	*0.00809 ***	*0.31472*	*0.00190 ***
Random Effects					
PT (intercept)	S.D.	0.0000	0.3913		
Aim (intercept)	S.D.	0.0996			0.2178
FT (intercept)	S.D.	0.8788		1.1983	
CollCount1	S.D.		0.6400	0.5761	0.5036
CollCount2	S.D.		0.7630	0.1458	1.4227
CollCount3	S.D.		0.6497	1.4615	27.8455
AIC		183.1	215.2	195.0	207.0
Correctly Predicted (Ratio)		0.8	0.7294	0.8235	0.7529
ANOVA (Type II Wald)					
	ExTime	6.1058	6.0287	6.8771	6.7149
	p-val	*0.01347 **	*0.01407 **	*0.00873 ***	*0.00956 ***
Hosmer and Lemeshow test					
	$\chi^2(8)$	10.219	6.4515	6.1124	
	p-val	*0.25*	*0.5968*	*0.6346*	
Pseudo R^2 (vs Model null)					
McFadden		0.1365	0.04628	0.1468	0.0869
Cox & Snell (ML)		0.1486	0.05311	0.1589	0.0974
Nagelkerke (Cragg &Uhler)		0.2147	0.07669	0.2296	0.1406
Likelihood Ratio Test		**Model 8**	**Model 9**	**Model 10**	**Model 11**
	χ^2	27.3580	9.2773	29.4370	17.4190
	p-val	<0.001***	0.5963	0.00194**	0.0961(.)
	df diff	-4	-11	-11	-11

Note: S.D. is for standard deviation, S.E. is for standard error

According to ANOVA, all models indicate a significant effect for ExTime with all p-values being less than 0.05. Similarly, Hosmer and Lemeshow's tests show no evidence of not-fit for all the models, which have p-values bigger than 0.05.[2] Model 8 and Model 10 both have higher Pseudo R^2 values, lower AIC values, and both models also predict success correctly, more than 80 percent.

Standard errors for random effects imply the variability in the intercept, according to the category (bigger the deviation, bigger the need for control). As expected, this is large (0.8788) for the category 'financial type of the project'.

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2   Also, larger McFadden's pseudo R^2 values indicate a better fit than smaller ones (A model with McFadden pseudo R^2 less than 0.2 is likely not slightly bad but by this metric, it isn't strong either). Nagelkerke and Cox&Snell measures give similar results, the latter being more conservative with smaller values. A Cox&Snell pseudo R^2 statistic of 0.1589 (Model10) is generally interpreted to mean, the ExTime independent variable in the model account for 15.89 percent of the explanation for a project's success according to expert opinion.

In models 9, 10, and 11; the big standard errors of random effects for collaborations point to the variability of these effects on project success, according to the categories 'Type of the project', 'Financial type of the project' and 'Aim of the project' respectively. Model 10 fits slightly better, according to the goodness of fit tests among these three models.

Intercept in model 9 will vary according to the project type (PT) approximately 16% $(0.64/4)^3$ in the case of collaboration with one entity, app. 19% $(0.7630/4)$ in the case of collaboration with two entities, app. 16% $(0.6497/4)$ in the case of collaboration with three entities. In product development and technology development projects, it is preferred to collaborate more, to combine competencies in a pool to increase capabilities. Therefore, it is expected that project success probability will increase with collaboration for the types 2 (consultancy and service), 4 (technology development), and 5 (product development); whereas types 1 (feasibility) and 3 (research infrastructure) would demand fewer parties in the project. In mixed-effect logistic models, odds ratios stand for the non-standardized effect size, therefore we checked these ratios (see Appendix C). When we examine the odds ratios, effect sizes decrease for types 1 and 3 and increase for 2 and 5 as expected, but decrease for type 4, against expectations. Therefore, our H1b of "If an R&D project is of type feasibility or research infrastructure development, projects are likely to be more successful with the decreasing number of collaborating institutions" is supported and H1a of "If an R&D project is of type technology development, product development, or consultancy and service, these projects are likely to be more successful with the increasing number of collaborating institutions" is not supported only for technology development projects and supported for others.

Intercept in model 10 will vary according to the project financial type (FT) approximately 14% $(0.5761/4)$ in the case of collaboration with one entity, app. 3% $(0.1458/4)$ in the case of collaboration with two entities, app. 37% $(1.4615/4)$ in the case of collaboration with three entities. Collaboration is expected to be a necessity for international (type 3) and TARAL projects (type 4) and the opposite for self-financed (type 1) and government-financed (type 2) projects because of the collaboration costs. It is expected for the odds ratios to increase with collaboration for types 3 and 4, decrease for types 1 and 2, both possible for type 5 (contractual). When we examine the odds, 3 and 4 increase as expected, but the others also increased with collaboration against expectations. For contractual projects, collaboration with two different entities has more effect size. Therefore, our H2b of "If an R&D project is funded internally or by limited government funds, projects are likely to be more successful with the decreasing number of collaborating institutions." is not supported, while H2a "If an R&D project is funded internationally or by a collaborative funding program (TARAL), projects are likely to be more successful with the increasing number of collaborating institutions" and H2c "If an R&D project is funded by a customer under a contract, it is hard to predict the effects of collaboration" supported.

Intercept in model 11 will vary according to the aim of the project (Aim) approximately 13% (0.5036/4) in the case of collaboration with one entity, app. 36% (1.4227/4) in the case of collaboration with two entities, app. 696% (27.8455/4) in the case of collaboration with three entities. It is expected that collaboration will increase the probability of success for the projects aiming to improve homeland security (type 4) or social prosperity/environment (type 3) or digital government (type 2), whereas decrease for the projects with economic goals (type 1). When we check the odds ratios, effect sizes increase for digital government and security projects as expected; but collaboration of more than two entities in economic and social prosperity/environment projects tend to decrease the probability of success. The huge effect size for security projects shows the importance of broad participation of potential stakeholders for this type. Our H3a of "If an R&D project is aiming to improve homeland security or social prosperity/environment or digitalization of governmental activities, projects are likely to be more successful with the increasing number of collaborating institutions" is not supported for social prosperity/environment projects and supported for others. H3b of "If an R&D project aiming at economic gains, projects are likely to be more successful with decreasing number of collaborating institutions" is supported.

The goodness of fit tests points to the mixed effect logistic regression "model 10" for a better fit. Due to the limited sample size, refitting the model and estimating the bootstrap parameters demonstrate how robust the results are. Therefore, this model is used to check the asymptotic assumptions via bootstrap estimations with 1000 replications. Bootstrap medians, standard errors, biases, and confidence intervals are given in Table 5.

Table 5
Bootstrap Results

	Orig.	Boot Biases	Boot SE	Boot Med.	CI Normal 95%	CI Basic 95%	CI Perc. 95%
Intercept	0.894	0.110	0.604	0.984	(-0.34, 1.97)	(-0.62, 1.87)	(-0.10, 2.40)
ExTime	0.806	0.097	0.390	0.858	(-0.06, 1.47)	(-0.25, 1.33)	(0.28, 1.86)
Intercept SD	1.198	-0.125	0.795	0.952	(-0.23, 2.88)	(-0.53, 2.40)	(0.00, 2.93)
CollCount1 SD	0.576	0.380	0.890	0.792	(-1.55, 1.94)	(-1.95, 1.12)	(0.03, 3.10)
CollCount2 SD	0.146	1.623	5.548	0.800	(-12.35, 9.40)	(-6.29, 0.26)	(0.03, 6.58)
CollCount3 SD	1.461	4.935	14.405	1.928	(-31.71, 24.76)	(-52.26, 2.85)	(0.07, 55.18)

Note: S.D. is for standard deviation

Bootstrap biases and standard deviations are sufficiently small for 'intercept', 'ExTime', 'sigma for FT intercept', and 'sigma for CollCount 1'. When we examine the histograms of the bootstrap estimations for observations resampling in Appendix D, distributions for random effects are skewed to the left as expected, and close to normal for the fixed effects.

Results and Discussion

In the examined models with lower AICs, the "ExTime" variable appears to have a positive effect on perceived success ("ExpOpin") of R&D projects. This indicates the extraordinary

nature of R&D projects. If stakeholders accept to give extra time to the project, most probably the R&D project shows promising results and proceeding in the new direction becomes a crucial issue for success, more than the planned due dates or project management performance do. In the early stages of research, it is more likely to deviate from planned duration, regarding the high uncertainty in it. As Hauser (1998) stated that criteria choices should differ according to the type of R&D (basic research, core technological development or applied research), perception of success is expected to differ among these groups. However, we could not find any random effects specific to the project type regarding the extra time in our data.

In addition to ExTime, ProjTime has high importance in trial 10, which is following Bizan's (2003) finding of the coherent increase in project duration and technical success.

In our models based on different features of the projects; "type", "financial type" and "aim"; encountering large standard errors in measuring the random effects of collaborations shows the large variability of these effects on project success. Cooper & Kleinschmidt (1995), Dwyer & Mellor (1991), Gaynor (1996), Maidique & Zirger (1985), and Souder & Jenssen (1999) show interdisciplinary work as a success factor for R&D projects. Collaboration often makes this interdisciplinary work less costly, and product development projects benefit from it.

Considering feasibility projects, which are usually small budgeted basic research projects, or research infrastructure projects, which are funded by the limited government funds; collaboration is sometimes not preferred due to the cost of collaboration and concerns on intellectual property rights. In our findings, decreasing effect sizes for collaboration in both feasibility and research infrastructure projects support these expectations.

Although the need for interdisciplinary work and resource pool increases the expectation of collaboration for technology development projects, the effect sizes in our findings decrease. The reason for this may be that technology development projects in this Institution are similar to feasibility projects in terms of budget size and complex IPR issues.

Effect sizes increase for projects, aiming at digital government and homeland security, as the collaborating institutions increase. These R&D projects often have so many stakeholders in hand, and success probability naturally increases when more of them collaborate.

Lessons Learned

There are limitations in this study, mainly the subjective nature of the dependent variable. Incomplete data are excluded from the analysis, and therefore, customer satisfaction, which is regarded as one of the main factors and measures for success (Cooper & Kleinschmidt, 1995; Dwyer & Mellor, 1991; Gaynor, 1996; Griffin & Page, 1993; Maidique & Zirger, 1985; Sou-

der & Jenssen, 1999; Pinto & Slevin, 1987), could not be analysed. This is because customer satisfaction is measured by general surveys at this Institute without directly addressing the projects. Other important limitations are the lack of criteria regarding the technical performance of the project outputs and the generalizability of results. These findings may be valid for similar countries by means of culture and/or Global Innovation Index ranks, but higher ranked and/or developed countries may be subject to different dynamics. Further studies that take these problems into account and use larger samples will deepen the results of this study.

Conclusions

This study aims to shed light on the uncertain and complex nature of R&D projects by investigating the possible effects of R&D collaborations. Our findings also contribute to efforts to understand the differences between "projects" and "R&D projects." For example, in the project management literature, exceeding the project deadline is a feature for failed projects, but on the contrary, it may be a predictor of success in the R&D project.

As reviewed in the literature, there are common success factors for R&D projects, but only extra time stood out among these control variables. Therefore, following the literature claiming the complexity of R&D, we can conclude that predicting the probability of success of an R&D project is not an easy task.

Policymakers often encourage any collaboration in R&D, but indeed the impact of multilateral collaborations on R&D project success depends on the type of these projects.

It will be useful to decide on the number of collaborating institutions, depending on the type, funding type, and the aim of the R&D projects. Product development projects, especially targeting digital government applications or homeland security, will increase the probability of success with collaboration. As Li et al. (2012) stated in their work, increasing the number of partners adds extra complexities to alliance management. Therefore, limited budget R&D projects are likely to have concerns about extra costs, but as the odds ratios increase against expectations, we may conclude that these projects can also benefit from collaboration.

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Appendices

A. Brief Summary of Model Selection Results

Trial No.	Variable Set	Selected Best Model's Response Variables	Best AIC	Evid. Weig.	Worst AIC	*	**
1	3-6,7-14,17-29	BudgetUr,AimHS,ProjTime,Ex Time,FTTaral,FTIn,PTNPD,PT ResInf	162.524	0.031	165.54	24	92
2	3-5,8-13,15-29	Budget,ProjTime,ExTime,FTTar al,FTIn,PTNPD,PTResInf	165.469	0.024	167.80	57	93
3	3-5,8-13,15-29	Budget,ProjTime,ExTime,FTTar al,FTIn,PTNPD,PTResInf	165.469	0.024	167.89	49	93
4	2-5,8-13,15-29	Budget,ProjTime,ExTime,FTTar al,FTPub,FTIn	169.012	0.025	171.52	49	93
5	2-6,7-14,17-23,29	BudgetUr,AimHS,ExTime,FTTar al,FTPub,FTIn	168.081	0.025	170.62	47	93
6	3-5, 8-13,15-29	ProjTime,ExTime,FTTaral,FTIn, PTNPD,PTResInf	166.167	0.025	168.67	42	93
7	2-5, 8-13,15-23,29	ClScore,ProjTime,ExTime,FTTar al,FTPub,FTIn	169.594	0.026	172.21	41	92
8	2-14,17-23,29	BudgetUr,AimHS,ExTime,FTTar al,FTPub,FTIn	168.081	0.025	170.62	47	93
9	3-14,17-29	BudgetUr,AimHS,ProjTime,Ex Time,FTTaral,FTIn,PTNPD,PT ResInf	162.524	0.031	165.54	24	92
10	3-5,8-13,15-29	BudgetUr,AimHS,ProjTime,Ex Time,FTTaral,FTIn,PTNPD,PT ResInf	162.524	0.031	165.54	24	92

Note: * for Models within 2 IC (information criterion). ** for Models to reach %95 evidence Weight. Variables 14, 15, 16 are used in the log scale.

B. Inferences from Model Selection Procedure

Trial	Variable	Estimate	S.E.	Importance	z value	Pr(>|z|)	CI.lb	CI.ub
1	(Intercept)	1.1903	0.566	1	2.102	0.036	0.080	2.300
	BudgetUr	1.0311	0.449	1	2.297	0.022	0.151	1.911
	ExTime	0.1033	0.035	1	2.966	0.003	0.035	0.172
	FTTaral	-3.1072	0.940	1	-3.305	0.001	-4.950	-1.264
	FTIn	-2.3100	0.561	1	-4.118	0.000	-3.409	-1.211
	PTResInf	-2.0877	1.089	0.96	-1.917	0.055	-4.223	0.047
	PTNPD	0.8871	0.577	0.89	1.539	0.124	-0.243	2.017
2	(Intercept)	1.6679	0.547	1	3.047	0.002	0.595	2.741
	ExTime	0.0847	0.031	1	2.747	0.006	0.024	0.145
	FTTaral	-2.8359	0.881	1	-3.217	0.001	-4.564	-1.108
	FTIn	-2.1876	0.534	1	-4.093	0.000	-3.235	-1.140
	PTResInf	-2.1839	1.069	0.99	-2.043	0.041	-4.279	-0.089
	ProjTime	-0.0174	0.008	0.97	-2.057	0.040	-0.034	-0.001

3	(Intercept)	1.6791	0.539	1	3.117	0.002	0.623	2.735
	ExTime	0.0847	0.031	1	2.757	0.006	0.025	0.145
	FTTaral	-2.8315	0.879	1	-3.221	0.001	-4.554	-1.109
	FTIn	-2.1846	0.535	1	-4.083	0.000	-3.233	-1.136
	PTResInf	-2.1991	1.072	0.98	-2.051	0.040	-4.301	-0.097
	ProjTime	-0.0171	0.008	0.96	-2.007	0.045	-0.034	0.000
4	(Intercept)	1.0854	1.002	1	1.083	0.279	-0.878	3.049
	ExTime	0.0748	0.028	1	2.676	0.008	0.020	0.130
	ProjTime	-0.0132	0.008	0.92	-1.669	0.095	-0.029	0.002
5	(Intercept)	0.9768	0.899	1	1.087	0.277	-0.785	2.738
	ExTime	0.0921	0.031	1	2.939	0.003	0.031	0.154
	BudgetUr	0.7597	0.449	0.93	1.693	0.091	-0.120	1.639
	FTTaral	-2.2417	1.332	0.83	-1.683	0.092	-4.852	0.369
6	(Intercept)	1.4908	0.587	1	2.541	0.011	0.341	2.641
	ExTime	0.0802	0.029	1	2.727	0.006	0.023	0.138
	FTTaral	-2.7958	0.862	1	-3.244	0.001	-4.485	-1.107
	FTIn	-2.1677	0.529	1	-4.099	0.000	-3.204	-1.131
	PTResInf	-1.9277	1.096	0.93	-1.758	0.079	-4.077	0.221
	ProjTime	-0.0107	0.007	0.89	-1.495	0.135	-0.025	0.003
7	(Intercept)	0.9844	0.925	1	1.065	0.287	-0.828	2.797
	ExTime	0.0765	0.028	1	2.710	0.007	0.021	0.132
8	(Intercept)	0.9817	0.925	1	1.062	0.288	-0.831	2.794
	ExTime	0.0922	0.031	1	2.939	0.003	0.031	0.154
	BudgetUr	0.7605	0.449	0.91	1.694	0.090	-0.119	1.640
	FTTaral	-2.2411	1.333	0.83	-1.682	0.093	-4.853	0.371
9	(Intercept)	1.1895	0.609	1	1.952	0.051	-0.005	2.384
	BudgetUr	1.0295	0.448	1	2.296	0.022	0.151	1.908
	ExTime	0.1032	0.035	1	2.963	0.003	0.035	0.172
	FTTaral	-3.1066	0.940	1	-3.303	0.001	-4.950	-1.263
	FTIn	-2.3101	0.561	1	-4.118	0.000	-3.410	-1.211
	PTResInf	-2.0849	1.090	0.96	-1.913	0.056	-4.222	0.052
	PTNPD	0.8886	0.577	0.89	1.539	0.124	-0.243	2.020
10	(Intercept)	1.4552	0.588	1	2.475	0.013	0.303	2.608
	ExTime	0.0799	0.029	1	2.714	0.007	0.022	0.138
	FTTaral	-2.8040	0.862	1	-3.255	0.001	-4.492	-1.116
	FTIn	-2.1738	0.525	1	-4.138	0.000	-3.203	-1.144
	PTResInf	-1.8747	1.108	0.92	-1.692	0.091	-4.046	0.297
	ProjTime	-0.0111	0.007	0.91	-1.559	0.119	-0.025	0.003

C. Odds Ratios

Odds	CollCount1	CollCount2	CollCount3	ExTime	Intercept
Model 9					
ProType1	1.2708	0.7515	0.7840	1.060	1.5889
ProType2	0.5907	1.8734	1.7066	1.060	2.5384
ProType3	2.0526	0.4243	0.4819	1.060	1.1851
ProType4	1.2962	0.7340	0.7685	1.060	1.5698
ProType5	0.9092	1.1202	1.1015	1.060	1.9499
Model 10					
FinType1	1.5446	1.1164	3.0131	1.069	0.6181
FinType2	1.2771	1.0639	1.8600	1.069	0.9180
FinType3	1.1542	1.0370	1.4387	1.069	1.1332
FinType4	2.0966	1.2061	6.5412	1.069	0.3274
FinType5	0.5624	0.8644	0.2322	1.069	5.055
Model 11					
Aim1	1.3475	2.3490	9.4051e-05	1.0655	2.4183
Aim2	1.2896	1.9151	60.5746	1.0655	2.2915
Aim3	1.4059	2.6585	2.0803e-05	1.0655	2.4669
Aim4	0.6129	0.2434	12532931	1.0655	1.7223

D. Histograms for Bootstrap (with 1000 replicates)
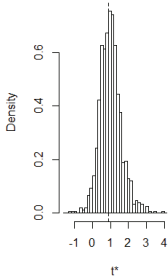
Histogram for Intercept
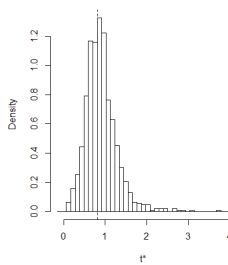
Histogram for ExTime
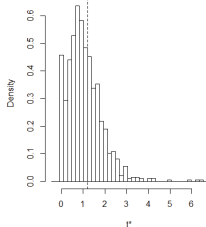
Histogram for CollCount1
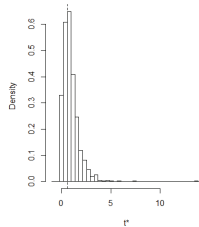
Histogram for CollCount 2
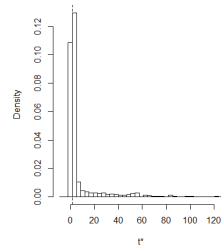
Histogram for CollCount 3

Istanbul Business Research

RESEARCH ARTICLE

The Antecedents of Economy-class Passenger Loyalty The Moderating Role of Airline Business Models: Full-service and Low-cost Airlines

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Abstract

In recent decades full-service airlines have targeted price-sensitive passengers, traditionally targeted by low-cost airlines, by promoting their economy class options. This paper aims to guide both types of airlines in promoting their economy-class options by utilizing factors influencing passenger preferences and loyalty. This paper identifies the relationship between the factors influencing economy-class passengers' airline preferences and passenger loyalty. It also shows the moderating the role of the airline business models, i.e., full-service and low-cost, in this relationship. The data was collected at airports from 418 passengers who had just traveled or would soon travel. The results indicate that schedule convenience influences the airline choice of economy-class passengers the most. Furthermore, passenger loyalty is significantly influenced by in-flight experience, schedule convenience, and punctuality, but not by affordability, assurance, and booking experience. Additionally, the type of airline business model moderates the influence of affordability on passenger loyalty. Full-service and low-cost airlines targeting price-sensitive passengers with economy class options are recommended to ensure schedule convenience and punctuality.

Keywords

Passenger Loyalty, Passenger Preferences, Economy-Class, Airline Business Model, Full-Service Airline, Low-Cost Airline

Introduction

The most prominent airline business models are full-service carriers and low-cost carriers. The competition between full-service and low-cost airlines in many countries has never been fiercer. Having seen the market size of price-sensitive passengers, full-service airlines have started competing against low-cost airlines by creating their second brands as low-cost carriers (Gillen & Lall, 2004). Furthermore, some full-service airlines have begun to offer very competitive economy class prices in recent years, with their prices often the same or even lower than those of low-cost airlines (Fourie & Lubbe, 2006). During the last decade, full-service airlines have been launching ads to promote their economy class by targeting

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price-sensitive passengers (Emirates Airlines, 2018). These developments point to the fact that it is now even more critical to understand the factors influencing economy-class passengers' choices, perceptions, preferences, and behavioral intentions (Caber, 2018; Mehta et al., 2019).

The general differences between full-service and low-cost airlines are the factors which distinguish their target markets. Full-service airlines target quality-seekers and are preferred by those who seek superior service quality, whereas low-cost airlines target price-sensitive customers and are generally preferred for their cheaper prices (Akpur & Zengin, 2019a; Baker, 2013; Caber, 2018; Chiou & Chen, 2010; Sezgen et al., 2019). Accordingly, full-service airlines differ from low-cost airlines regarding free luggage capacity, catering services, loyalty programs, early-booking opportunities, punctuality during take-off or landing, the number of direct flight options, and other services. Therefore, factors influencing passengers' airline preferences (FIPAPs) differ between these airline business models, i.e., full-service and low-cost carriers, since there are significant differences between these models (Caber, 2018; Kilinc et al., 2012; Koklic et al., 2017; Kurtulmuşoğlu et al., 2016; Rajaguru, 2016).

The literature on this topic includes papers determining the differences between full-service and low-cost airlines in terms of FIPAPs (Evangelho et al., 2005; Fourie & Lubbe, 2006; Mason, 2000, 2001). However, comparisons made in those papers have been based on either general or business class passengers. As yet, no article focusing on the differences between their economy classes in terms of FIPAPs has been found in the literature. An elaboration on these differences is required to be able to lead both types of airlines on how to promote their offerings, particularly when full-service airlines have targeted price-sensitive customers traditionally targeted by low-cost airlines. Furthermore, as the competition gets fiercer for economy-class passengers, retaining passengers, i.e., ensuring passenger loyalty, is getting more crucial than ever (Shen & Yahya, 2021).

Both full-service and low-cost airlines, therefore, need to aim to create passenger loyalty, which can be defined as a positive attitude towards an airline fostering repetitive ticket purchases in the future (Akamavi et al., 2015). A large number of research papers focusing on passenger loyalty in the airline industry have been published (Akpoyomare, Patrick Ladipo Kunle, & Ganiyu, 2016; An & Noh, 2009; Atalık, 2009; Boubker & Naoui, 2022; Chang & Hung, 2013; Chang & Chang, 2010; Chen & Hu, 2013; Chonsalasin et al., 2021; Chung et al., 2022; Curry & Gao, 2012). Although the papers in the relevant literature have compared the antecedents of passenger loyalty, those papers have collected data from either quality-seekers or price-sensitive passengers. Therefore, there is a need to unveil the influence of FIPAPs on the loyalty of economy-class passengers by collecting data from both full-service and low-cost airline passengers. A research paper covering this gap is vital, particularly when full-service airlines target price-sensitive passengers traditionally targeted by low-cost airlines.

This paper aims to guide both full-service and low-cost airlines in promoting their economy class options from a passenger perspective. To this aim, this study identifies factors influencing economy-class passenger preferences of both full-service and low-cost airlines and draws a comparison between the two. This paper also unveils the influence of FIPAPs on the loyalty of economy-class passengers and tests the role of the airline business model in this influence. In the following section the literature covering passenger loyalty and the theoretical background for the hypotheses are explained. The paper then describes the sampling, data gathering, and analyzing procedures used in the research process. After the results section, a discussion and conclusion are presented, along with suggestions, limitations, and directions for further research.

Conceptual Background and Hypothesises

A Comparison between Full-service and Low-cost Airlines in terms of FIPAPs

The two most critical FIPAPs are the service quality and affordability of the ticket prices (Boubker & Naoui, 2022; Caber, 2018). These two factors separate passenger groups into those seeking a superior service and those seeking cheaper prices (Dennis, 2007; Forgas et al., 2010; Mikulić & Prebežac, 2011). While full-service airlines target passengers who seek qualified service, low-cost airlines target passengers with high price sensitivity (Curry & Gao, 2012). In other words, while passengers of low-cost airlines make their preferences primarily on prices, passengers of full-service airlines make their purchase decisions based on service quality. For this reason, full-service airlines provide a full range of services from pre-flight to after-flight (Lee et al., 2018).

Another factor influencing passenger preferences is the provision of direct flights offering convenient flight times for passengers. While low-cost airlines tend to operate flights to highly preferred destinations to guarantee occupancy, full-service airlines may have the option of operating numerous direct flights to a greater variety of locations due to their larger fleet capacity. Additionally, low-cost airlines prioritize only rush-hour flights to reduce airport payments. In conclusion, full-service airlines provide more direct flights between destinations and more convenient flight times than low-cost airlines, thanks to having a larger fleet (Çetin et al., 2016).

Today's highly regulated air transportation environment in terms of security and safety forces airline business models to increase safety levels. However, Mehta et al. (2019) provide evidence that passengers' risk-taking tendencies are not one of the significant predictors of passengers' preference between full-service and low-cost carriers. That being said, fleets of full-service airlines that provide a superior service may be more modern than low-cost ones. For this reason, passengers may assume and perceive that full-service airlines are more reli-

able due to their relatively new fleet. Therefore, they may prefer full-service airlines in terms of flight safety and security.

Both full-service and low-cost airlines aim to minimize their ground time at airports and keep their aircraft flying as much as possible. Moreover, by seeking to use their fleets more efficiently and minimize airport turnaround time, low-cost airlines typically reduce boarding and disembarking time, thus increasing the frequency of their scheduled flights more than full-service ones. In summary, the turnaround periods of low-cost airlines are shorter than full-service airlines (Acar & Karabulak, 2015). When everything is in good working order, this method significantly reduces costs. However, in case of unexpected circumstances, it may result in the frequent delay of flights.

By comparion, full-service airlines are under relatively less pressure due to the higher cost of their tickets, so they generally keep the time between their flights longer, thus enabling them to tolerate unexpected problems without any inconvenience to their passengers. In conclusion, full-service airlines may be more punctual in operating in a timely manner and they may have shorter delay periods than low-cost airlines. Therefore, passengers may prefer full-service airlines for their punctuality. In line with this notion, the following hypothesis is formulated:

H_1: There are significant differences between full-service and low-cost airlines regarding FIPAPs.

The Relationship between FIPAPs and Passenger Loyalty

Loyalty can be defined as the highest level of commitment on behalf of a customer and it manifests itself in positive attitudes toward the brand and in behavior of repeat purchases (Oliver, 2014). Passenger loyalty consists of four steps: conative loyalty, affective loyalty, cognitive loyalty, and behavior loyalty. Conative loyalty is formed when a brand leads among alternatives according to its functional features, such as price and quality. This type of loyalty is the weakest one since the rivals may exceed functional features at any time. The second phase of loyalty refers to customers' feelings and emotions. Oliver (1999) stated that true loyalty starts during the affective loyalty phase since emotional ties are formed between the customer and the brand. Therefore, effective loyalty is the beginning of true loyalty in those stages. The next level of loyalty is cognitive loyalty, representing the customer's tendency to make recurring purchases and brand recommendations. The last loyalty level, action loyalty, is formed as a result of these three loyalty levels. Thus, the most substantial loyalty level represents a strong bond between the brand/company and the customer (Blut et al., 2007; Oliver, 2014).

Those four critical stages of customer loyalty are summarized in two categories: attitudinal and behavioral dimensions (Lee et al., 2018). Attitudinal loyalty refers to a favorable

attitude to a particular brand, whereas behavioral loyalty implies recommendations and repeating purchasing behaviors. Attitudinal loyalty contains the first three stages (conative, affective, and cognitive), while behavioral loyalty involves action loyalty, which results from attitudinal loyalty (Han et al., 2011; Lee et al., 2018; Namukasa, 2013; Oliver, 2014).

Academic papers focusing on passenger loyalty may be categorized into four groups. The first group of papers focuses on identifying the antecedents of customer loyalty (Akamavi et al., 2015; Akhter et al., 2011; Boubker & Naoui, 2022). The research in the second group aims to determine the effect of perceived value, service quality, public opinion, and satisfaction on passenger loyalty (Akpoyomare, Patrick Ladipo Kunle, & Ganiyu, 2016; An & Noh, 2009; Atalık, 2009; Chang & Hung, 2013; Chang & Chang, 2010; Chen & Hu, 2013; Chonsalasin et al., 2021; Chung et al., 2022; Curry & Gao, 2012). Those in the third group examine customer loyalty to low-cost airlines (Akamavi et al., 2015; Evangelho et al., 2005; Shen & Yahya, 2021). Those in the fourth group compare full-service and low-cost airlines regarding the antecedents of passenger loyalty (Forgas et al., 2010; Koklic et al., 2017; Mikulić & Prebežac, 2011).

The FIPAPs reflect passenger expectations in terms of the transportation service they purchase. Fulfilling passengers' expectations results in passenger satisfaction. Satisfaction is the most important antecedent of passenger loyalty in both full-service and low-cost airlines (Akamavi et al., 2015; Chonsalasin et al., 2021; Forgas et al., 2010; Leong et al., 2015). Namukasa (2013) argued that the quality of services provided before, during, and after the flight influenced passenger loyalty through satisfaction. Therefore, meeting passenger expectations regarding FIPAP results in passenger loyalty (Boubker & Naoui, 2022).

Additionally, service quality, one of the most critical factors influencing airline preferences, positively affects passenger loyalty (Boubker & Naoui, 2022). Furthermore, punctuality, modern airplanes, and loyalty programs are other FIPAPs. These factors also affect the passengers' tendency to make recurring purchases and to recommend services to others positively (Vlachos & Lin, 2014). Additionally, ticket price, another factor influencing passenger preferences, directly affects passenger loyalty (Boubker & Naoui, 2022; Jiang & Zhang, 2016). In light of the information above, the following hypothesis is suggested:

H_2: FIPAPs significantly influence passenger loyalty.

Passenger Loyalty in Full-service and Low-cost Airlines

The most crucial rivalry elements used by full-service airlines are the service variety they provide their passengers and their loyalty programs (Atalık, 2009; Escobari, 2011; Klophaus, 2005; Lee et al., 2018; Yang & Liu, 2003). Saha and Theingi (2009) and Mikulić and Prebežac (2011) have concluded that passenger loyalty may be affected positively or negati-

vely by the quality of cabin services provided and the internal cabin environment (comfort, atmosphere, ambiance, and interior design). Gilbert and Wong (2003) stated that the internal cabin environment influences passenger loyalty directly. In addition to this, ticket prices also significantly affect passenger loyalty (Jiang & Zhang, 2016). Chang and Hung (2013) concluded that ticket price is the second-most important factor influencing passenger loyalty in low-cost airlines.

Both full-service and low-cost airlines aim to create passenger loyalty, although they use different instruments to achieve it. While low-cost airlines use the instrument of low ticket prices, full-service airlines use superior service quality instruments. Low price addresses the cognitive aspect of passengers, and rivals easily imitate it. Cognitive loyalty is the weakest loyalty level (Oliver, 1999). Furthermore, full-service airlines' superior service quality and loyalty programs target passengers' emotional aspects by creating affective, conative, and action loyalties (Lee et al., 2018). Therefore, passengers' loyalty to full-service airlines is more robust than passengers' loyalty to low-cost airlines. Based on this information, the following hypothesis is formulated:

H_3: Passenger loyalty to full-service airlines is significantly greater than passenger loyalty to low-cost airlines.

FIPAPs and passenger loyalty are assumed to differ in the same way as the previous hypothesis by providing theoretical backgrounds. Furthermore, FIPAPs are assumed to affect passenger loyalty. In line with this, when the airline business model is full-service, the influence of FIPAPs on passenger loyalty is greater than when it is low-cost. In this regard, the following hypothesis is formulated:

H_4: Airline business model moderates the relationship between the FIPAPs and passenger loyalty.
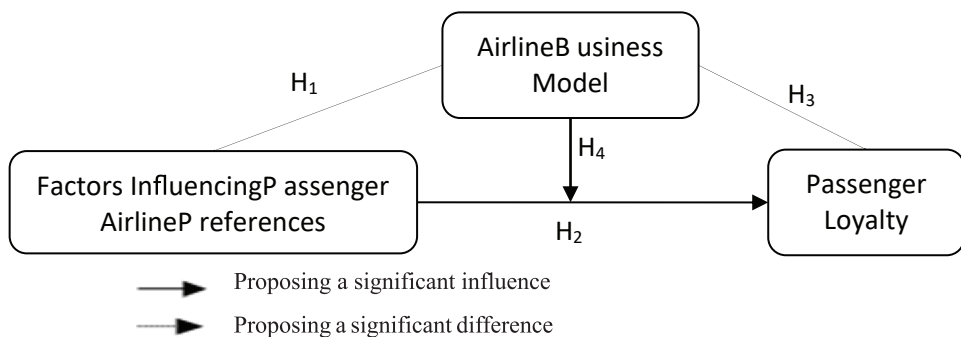
Figure 1. The theoretical model.

Methodology

Population and Sampling

This quantitatively designed research aims to identify the differences between full-service and low-cost airlines regarding FIPAPs and their influence on passenger loyalty. People who had recently traveled or would soon travel were chosen to take part in the research. Airports are the right places to find people who have purchased airline tickets. Most domestic and international flights in Turkey are operated from Atatürk and Sabiha Gökçen Airports (Caber, 2018). Therefore, the data was gathered from passengers traveling from/to Atatürk and Sabiha Gökçen Airports in Istanbul. Selection of respondents was made using a convenience sampling method. Passengers waiting either for their flights or their luggage were requested to participate in the research. Questionnaires were handed over to those who were willing to participate. These had been prepared in both Turkish and English. The data was collected from passengers who could speak Turkish or English and who had just traveled / would travel domestically or internationally. In total, 470 thoroughly answered questionnaires were handed back to the researchers by the respondents at the end of this process.

Measures and Measurements

The questionnaire that was used while collecting the data consisted of three parts. The first part included questions to identify the demographic characteristics of the respondents. The second part consisted of questions regarding respondents' travel habits and the travel they had just done or would soon do. Respondents were asked to identify the name of the airlines they had just traveled on/ would soon travel on, and in order to understand the airline business model a search was made via the ICAO (2020). The second part of the questionnaire also included a scale to measure passenger loyalty. Three statements, adopted from Koklic et al. (2017), measured passenger loyalty: planning to keep traveling with the same airline, general satisfaction, and recommending the airline to others. Respondents were asked separately to identify their level of agreement with each statement (1: completely disagree … 5: completely agree).

The third part of the questionnaire included a scale to measure FIPAPs. This scale was formed based on the works of Çelikkol et al. (2012), Kurtulmuşoğlu et al. (2016), Jiang and Zhang (2016), and Park (2007). After compiling factors influencing passengers' airline preferences from the research in question, structured interviews were carried out with more than ten people who work in different sectors and regularly travel in order to ensure content and face validity. During the interviews, respondents were asked to read the factors/statements and explain what they understood from each separately. Then comparisons were made between the intended and actual meaning (what respondents understood) to assure congruence.

They were also asked if each statement had a clear meaning and the extent to which they differed. In line with the results of those interviews, some statements were modified. The scale presented in Appendix 1 includes 26 statements to measure FIPAPs. Respondents were asked to identify how effective each statement was on their airline ticket purchase decision for the travel they had just undertaken or were about to undertake using options from 1 to 5. (1: Not effective at all; 2: Slightly effective; 3: Moderately effective; 4: Quite effective; 5: very effective).

Data Analysis

Before analyzing the data, some questionnaires were eliminated based on the general coherence of the answers and their coherency to the control questions related to ticket prices. In the process, 52 questionnaires were eliminated, and data from 418 respondents were analyzed. Factor and Cronbach's Alpha analysis at SPSS and confirmatory factor analysis at AMOS were used to ensure the data's structural validity and internal consistency. The effect of the airline business model on FIPAPs and passenger loyalty was tested by path analysis at AMOS. Furthermore, the comparisons between full-service and low-cost airlines regarding passenger loyalty and FIPAPs were tested by the Independent Sample t-Test at SPSS.

Results

Demographic Characteristics of the Respondents

The demographic characteristics of the respondents were listed under the categories of sex, age, education, income, and occupation. More than half of the respondents (59%) were male, and 41% were female. The gender split of the respondents was close to even. FIPAPs and passenger loyalty were compared between males and females. The results of the Independent Sample t-Test indicated no significant differences between the two groups regarding FIPAPs ($p=0.265>0.05$) and passenger loyalty ($p=0.926>0.05$). Additionally, 40% of respondents were between the ages of 18-25, 35% were between the ages of 26-35, and 18% were between 36 and 45. In summary, the majority of respondents consisted of young and middle-aged people. The results of One Way ANOVA indicated that there were no significant differences between different age groups in terms of FIPAPs ($p=0.434>0.05$) and passenger loyalty ($p=0.057>0.05$).

The results of One Way ANOVA also indicated that there were no significant differences between different education levels regarding FIPAPs ($p=0.077>0.05$) and passenger loyalty ($p=0.568>0.05$). In terms of education level, 20% of the respondents had a postgraduate degree, 62% had a bachelor's degree from a higher education institution, 12% had a degree from a vocational school, and 7% had a degree from a high school. In terms of occupation,

40% of the respondents worked in the private sector, and 20% worked in public institutions. Furthermore, 28% of the respondents were students. Regarding monthly income levels, 75% of the respondents earned around $680 or less. Only 14% of the respondents' monthly incomes were $1,096 or more. These low-income levels in USD ($) can be explained by the low value of the Turkish Lira against the USD. The results of One Way ANOVA indicated that there were no significant differences between different income levels regarding FIPAPs (p=0.272>0.05) and passenger loyalty (p=0.540>0.05).

Travel Habits of Respondents

The respondents had just traveled / would soon travel by 14 different full-service airlines: THY, Azal, Etihad, Air China, Qatar, United, Korean, Austrian, American, Emirates, Royal Jordanian Air, Jet, Middle East, and Aeroflot. The rest of the respondents had just traveled / would soon travel by ten different low-cost airlines: Pegasus, Onur Air, Anadolu Jet, AtlasGlobal, SunExpress, Ryanair WizzAir, Lion, Scat, and Mahan Air (ICAO, 2020). 62% of the respondents had chosen one of the full-service airlines, and 38% had chosen one of the low-cost airlines.

All the respondents had economy-class tickets. Regarding purpose of travel, 95% of the respondents were traveling for a holiday, family/relative visit, business, or education. The respondents were asked about their travel frequency within the previous year and airline preferences for those journeys. On average, respondents had flown 13 times in the previous year, with the vast majority of them having undertaken 5 to 21 flights in the same year. In order to fill out the questionnaire it was crucial to understand how well the respondents knew the airlines. This is why respondents were asked how many flights they had had with the same airline in the previous year and the percentage of flights with the same airline from the total number of flights undertaken that year. On average, respondents had traveled eight times with the same airline within the previous year. Respondents, on average, had undertaken 66% of their flights with the same company within the previous year. These results indicate that respondents were mainly regular passengers of the airlines for which they had filled in the questionnaire.

Factors Influencing Passengers' Airline Preferences

Both exploratory and confirmatory factor analyses were conducted to summarize numerous variables into fewer and easy-to-interpret factors and ensure construct validity. KMO value (0.90) and Chi-Square value (5285.831) of Barlet's test being statistically significant (p=0.00 < 0.05) indicated that the data set was suitable for exploratory factor analysis. Statements related to FIPAPs were categorized into six groups via factor analysis. Based on the results of the analysis, three statements, namely the attitude of cabin crew (mean value: 3.70), aircraft hygiene (mean value: 3.96), and free baggage allowance (mean: 3.30), were excluded from

the scale because they had high factor loads in two different factors. Consequently, 23 statements related to FIPAPs were categorized into six factors through exploratory factor analysis.

The extracted factors were in-flight experience, assurance, schedule convenience, booking experience, punctuality, and affordability. In-flight experience represents the richness and quality of service provided to the passenger inside the cabin, and this factor is named in line with An and Noh (2009) and Akpur and Zengin (2019a). Assurance consists of indicators that give the passenger confidence that there will be no accidents during the flight. This dimension is named in line with Calisir et al. (2016). Schedule convenience is related to the airline's ability to offer a direct flight to the desired destination at a convenient time for the passenger. Schedule convenience is named in line with Park (2007). Booking experience is related to whether the airline has a suitable system for easy online check-in, seat selection procedures, and error-free information about the flight. This dimension is named in line with Kurtulmuşoğlu et al. (2016) and Jiang and Zhang (2016). Punctuality represents the flight being operated on time without having a period of delay during take-off and landing. This factor is in line with Kurtulmuşoğlu et al. (2016) and Vlachos and Lin (2014). Affordability is related to low ticket prices, discounts, and installments in the payment. Affordability is named in line with Calisir et al. (2016).

Confirmatory Factor Analysis was applied to validate the measurement model consisting of six latent and 23 directly observed variables. Factor loads and mean values of each latent variable in the theoretical model, presented in Table 1, indicated that the measurement model had a good model fit (CMIN: 642.83; P: 0.00<0.05; CMIN/DF: 642.83/212= 3.03; NFI: 0.902; IFI: 0.932; CFI: 0.932; RMSEA: 0.070). Furthermore, the general reliability of each construct, Composite Reliability (CR), and the internal consistency of each construct, Cronbach's Alfa (CA), indicated high reliability of the constructs. Convergent and discriminant validities were also evaluated. The results in Table 1 indicated that both convergent and discriminant validities were achieved (Hair et al., 2014). Finally, the results provide evidence that the structures in the model meet standards of reliability and construct validity.

Table 1
Validity and Reliability scores FIPAPs

	Latent Variables	Mean	Factor Loads	CA	CR	AVE	MSV	1	2	3	4	5	6
1	Punctuality	3.76	0.85-0.86	0.84	0.84	0.73	0.37	**0.85**					
2	In-flight Experience	3.47	0.65-0.81	0.90	0.90	0.56	0.54	0.61	**0.75**				
3	Assurance	3.78	0.75-0.93	0.88	0.89	0.73	0.54	0.56	0.73	**0.85**			
4	Schedule Convenience	3.86	0.74-0.86	0.86	0.86	0.61	0.46	0.54	0.68	0.60	**0.78**		
5	Booking experience	3.66	0.79-0.95	0.89	0.90	0.76	0.34	0.59	0.58	0.49	0.50	**0.87**	
6	Affordability	3.41	0.62-0.89	0.86	0.85	0.60	0.13	0.31	0.25	0.29	0.30	0.36	**0.77**

The mean values of the FIPAPs show that Schedule Convenience is the factor influencing economy-class passenger preferences the most, and Assurance and Punctuality follow it. This result indicates that, while making a ticket purchase decision, economy-class passengers pay attention mainly to the convenience of flight time, assurance of the airline regarding safety, and punctuality. Contrary to the expectation, factors that have a minor influence on economy-class passenger preferences are in-flight experience and affordability, regardless of the airline business model. However, affordability and in-flight experience moderately affect economy-class passenger preferences.

The Differences between Full-service and Low-cost Airlines in terms of FIPAPs and Passenger Loyalty

The differences between full-service and low-cost airlines in terms of FIPAPs and passenger loyalty were tested by the Independent Sample t-Test. The results prove that in-flight experience, schedule convenience, assurance, and punctuality influence passengers' preferences for full-service airlines more than for low-cost airlines. On the other hand, affordability influences passengers' preferences for low-cost airlines more than for full-service airlines. Furthermore, there are no significant differences between full-service and low-cost airlines regarding the booking experience. These results indicate that the H_1 hypothesis is partly supported.

Table 2
Results of Independent Sample t-Tests

FIPAPs		Levene Test		t-test for Equality of Means					
		F	Sig.	t	Sig.2	Business Model	N	Mean	Mean Diff.
In-flight experience	1	45.04	0.00	5.90	0.00	Full-service	254	3.70	0.61
	2			5.42	0.00	Low-Cost	159	3.09	
Schedule convenience	1	8.67	0.00	3.06	0.00	Full-service	254	3.97	0.28
	2			2.92	0.00	Low-Cost	159	3.69	
Assurance	1	24.24	0.00	3.66	0.00	Full-service	254	3.93	0.38
	2			3.43	0.00	Low-Cost	159	3.55	
Punctuality	1	30.33	0.00	2.73	0.01	Full-service	254	3.88	0.33
	2			2.57	0.01	Low-Cost	159	3.56	
Booking experience	1	12.96	0.00	1.68	0.09	Full-service	254	3.73	0.20
	2			1.60	0.11	Low-Cost	159	3.54	
Affordability	1	2.01	0.16	-4.32	0.00	Full-service	254	3.35	-0.25
	2			-4.41	0.00	Low-Cost	159	3.60	
Passenger loyalty	1	18.41	0.00	-4.32	0.00	Full-service	254	4.36	0.87
	2			-4.41	0.00	Low-Cost	159	3.49	

1: Equal variances assumed; 2: Equal variances not assumed.

Passenger loyalty to full-service airlines is significantly greater than that to low-cost airlines. This result means the data supports the H_3 hypothesis. Full-service airlines focus on enhancing service quality to attract prospective customers and retain current customers thro-

ugh loyalty programs. On the other hand, low-cost airlines focus on providing relatively low-priced tickets with no-frills services and restrictions on baggage allowances to attract and retain customers (Akpur & Zengin, 2019b). Since the price targets cognitive loyalty, the weakest loyalty level, this result aligns with the literature (Oliver, 2014).

The Relationship between FIPAPs and Passenger Loyalty and the Moderating Role of Airline Business Model

FIPAPs were categorized into six groups: in-flight experience, schedule convenience, assurance, punctuality, booking experience, and affordability. The influence of these dimensions on passenger loyalty was tested in AMOS. Mean values for FIPAPs were first calculated based on their measured variables to represent respective constructs in the structural model. The model also included the airline business model as an interacting variable to answer the question of what role the airline business model played in the relationship between dimensions of FIPAPs and the loyalty of economy-class passengers. The standardized values for all dimensions of FIPAPs were calculated. Then the values of interacting variables for respondents were computed by multiplying the standardized values of dimensions of FIPAPs with the airline business model. The model in AMOS included six independent variables, six interacting variables, an airline business model, and passenger loyalty as dependent variables.

Since passenger loyalty was not included in the confirmatory factor analysis, its factor loads were evaluated here. Factor loads of three statements of passenger loyalty were between 0.83 and 0.93, and they were statistically significant (Sig.< 0.000 and C.R.< 23.378). The model fit indices showed how well the data supported the theoretical model. The model fit indices CMIN($\chi2$): 15.935; p: 1.137>0.05; CMIN/SD: 15,935/10 = 1.593; NFI: 0.991; IFI: 0.997; CFI: 0.997; RMSEA: 0.038; GFI: 0.990; AGFI: 0.965) indicated excellent fit (Meydan & Şeşen, 2015). In other words, the theoretical model was supported by the dataset quite well.

Table 3
Standardized Regression Coefficients

Dependent Variable		Independent Variable	Standardized Coefficients	S.E.	C.R.	P
Passenger Loyalty	<---	In-flight experience	0.185	0.054	3.154	0.002
Passenger Loyalty	<---	Schedule convenience	0.167	0.054	2.830	0.005
Passenger Loyalty	<---	Punctuality	0.119	0.052	2.086	0.037
Passenger Loyalty	<---	Affordability	-0.019	0.045	-0.393	0.694
Passenger Loyalty	<---	Affordability*ABM[1]	0.170	0.031	3.522	***
Passenger Loyalty	<---	ABM	0.216	0.054	3.377	***

[1]: Interacting variable; ABM: Airline Business Model; ***: Sig.<0,001

Although the data support the model, the influences of all dimensions of FIPAPs are not significant. The results show that only three of the FIPAPs, in-flight experience, schedule convenience, and punctuality, significantly influence passenger loyalty (p<0.05 and C.R.<1.96).

Assurance, booking experience, and affordability do not significantly affect passenger loyalty. This indicates that H_2 is partly supported. The results indicate that when the in-flight experience in aircraft, schedule convenience, and punctuality go up by one standard deviation, passenger loyalty increases by 0.185, 0.167, and 0.119 standard deviations, respectively. However, the regression weights for assurance, booking experience, and affordability in predicting passenger loyalty are not significantly different from zero at the 0.05 level (two-tailed). Those results indicate that in-flight experience, schedule convenience, and punctuality significantly influence the loyalty of economy-class passengers, whereas assurance, booking experience, and affordability do not influence it.

The results indicate that the airline business model moderates ($\beta = 0.17$, $t = 3.522$, $p < 0.001$) only the influence of affordability among dimensions of FIPAPs on passenger loyalty. Affordability significantly influences passenger loyalty when an airline is a full-service one, but it does not when it is a low-cost carrier. This result indicates that H_4 is partly supported. To conclude, low ticket prices and payment facilities foster the loyalty of economy-class passengers for full-service airlines but not for low-cost airlines. Additionally, regardless of airline business models, in-flight experience, schedule convenience, and punctuality influence the loyalty of economy-class passengers.

```
┌─────────────────────────────┐
│   Airline Business Model    │
└─────────────────────────────┘
              │
              │  (Moderating effect- Significant)
              │  β= 0.170, t= 3.522, p <0.001
              ▼
┌──────────────────┐        ┌──────────────────┐
│  Affordability   │───────→│ Passenger Loyalty│
└──────────────────┘        └──────────────────┘
       (Direct effect– Not significant)
       β= -0.019, t= -0.393, p >0.05
```
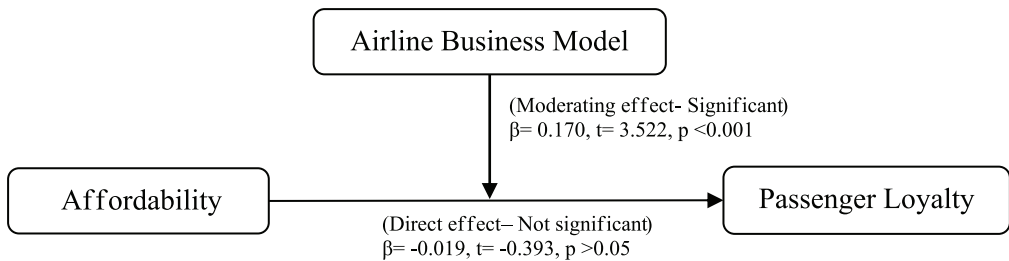
Figure 2. Moderating role of airline business model on the relationship.

Discussion and Conclusion

This paper identifies the influence of FIPAPs on passenger loyalty and tests the moderating role of airline business models on this influence for economy class. This paper also compares full-service and low-cost airlines regarding FIPAPs and passenger loyalty. The results indicate that schedule convenience influences airline preferences the most, regardless of airline business models. In other words, airline preferences of economy-class passengers are affected the most by the convenience of flight times and the availability of direct flights. This result supports the works by Çetin et al. (2016) and Banerji et al. (2022). Çetin et al. (2016) argued that the option of a direct flight significantly influences tourist preferences. Banerji et

al. (2022) concluded that on-time arrival is the most critical factor that passengers consider while purchasing. The second most crucial factor influencing passenger airline preferences is the assurance of airlines in terms of safety. Passengers consider assurance the most crucial factor regarding alternatives (Lee et al., 2018). Punctuality, which stands for operating on time by having no or low latency time during take-off and landing, is the third factor influencing airline preferences. This result is consistent with the literature (Kurtulmuşoğlu et al., 2016).

An interesting result of this research is that affordability and in-flight experience, which are the two most prominent factors distinguishing the target market of both full-service and low-cost airlines (Boubker & Naoui, 2022; Caber, 2018; Lee et al., 2018), influence passenger preferences the least among other factors. This result can be explained by the fact that the research population consists of quality seekers and price-sensitive passengers. Also, this result necessitates making comparisons between full-service and low-cost airlines. The results indicate that the in-flight experience provided to passengers influences passenger preferences for full-service airlines more than for low-cost airlines. However, affordability has more influence on passenger preferences of low-cost airlines than passenger preferences of full-service airlines. These results confirm that low-cost airlines are more associated with cheaper ticket prices, whereas full-service airlines are more associated with superior service quality (Caber, 2018).

Furthermore, assurance, schedule convenience, and punctuality are the FIPAPs of full-service airlines more than the passenger preferences of low-cost airlines. These results partially contradict the results of Mehta et al. (2019) who argue that assurance is not a significant predictor of passengers' preference between full-service and low-cost carriers. However, they are consistent with the results of Chiou and Chen (2010), who argue that service quality perception is a latent variable with the most significant influence on passenger preferences on full-service airlines. Consequently, passengers prefer the economy classes of full-service airlines for the experience they have on the flight, the assurance, the convenient flight schedule, and the punctuality rather than economy classes of low-cost airlines. However, economy classes of low-cost airlines are preferred over economy classes of full-service airlines for only their affordability.

Furthermore, the results indicate no significant difference between full-service and low-cost airlines in booking experience. This result can be explained by comparing passengers' expectations of both full-service and low-cost airlines regarding booking experience. Regardless of airline business models, passengers evaluate the availability of online check-in, online seat selection, and full notification about flights as a necessity, not as a distinguishing factor. These results further support Fourie and Lubbe's (2006) idea, highlighting that domestic full-service and low-cost airlines have been competing strongly on many attributes, including price, in recent years.

In-flight experience, schedule convenience, and punctuality significantly influence passenger loyalty. This result supports the literature which states that service quality influences passenger loyalty in low-cost airlines and full-service airlines (Calisir et al., 2016; C. Chen & Liu, 2017; Boubker & Naoui, 2022; Chonsalasin et al., 2021; Koklic et al., 2017; Lee et al., 2018; Loureiro & Fialho, 2017). However, affordability, assurance, and booking experience do not significantly influence passenger loyalty. This result can be explained by the fact that assurance and booking experience are factors that passengers evaluate as liabilities for airlines, not as factors that create privilege and distinguish the airline from its competitors.

Furthermore, the airline business model moderates the influence of affordability on passenger loyalty and makes it significant if the airline is a full-service one. The airline business model's moderating role provides evidence that having a full-service airline increases the influence of affordability on passenger loyalty. This result partially supports the work of Shen and Yahya (2021). Affordability is an attribute related to functional features of the service, and thereby, it may be exceeded by the rivals at any time. Therefore, affordability is one of the functional features targeting passengers' cognitive side (Oliver, 2014). However, affordable ticket prices from full-service airlines foster the loyalty of economy-class passengers. This result is in line with the fact that full-service airlines have been competing intensely on the price of economy-class in recent years, with their price often the same or even lower than that of low-cost airlines (Fourie & Lubbe, 2006). Consequently, affordability may not be an attribute that leads to loyalty for economy-class passengers of low-cost airlines, but it is for economy-class passengers of full-service airlines.

Another interesting result of this research is that the influence of in-flight experience on passenger airline preferences -the factor which affects passenger loyalty the most- is the lowest one, together with affordability, among the other factors. The significant difference between full-service and low-cost airlines in terms of in-flight experience can explain this result. Additionally, assurance, one of the most influential factors on passenger airline preferences, does not affect passenger loyalty. This result indicates that passengers think of airlines' accident history and the possibility of having an accident before choosing one. However, it does not have a significant influence when it comes to repetitive purchases and attitudes toward the airline brand.

The passenger loyalty level of full-service airlines is significantly higher than the passenger loyalty of low-cost airlines. This result is also consistent with the work of Koklic et al. (2017), arguing that passengers of full-service airlines are more loyal than passengers of low-cost airlines. Lee et al. (2018) concluded that customer satisfaction influences attitudinal loyalty in full-service airlines more than in low-cost airlines. This result also supports the notion that low-ticket price targets cognitive loyalty, whereas superior service targets affective and conative loyalties with stronger loyalty (Oliver, 2014). Finally, this result is consistent

with the fact that full-service airlines usually deliver loyalty programs to their passengers to maintain and strengthen their good relationships with their passengers.

Managerial Implications

The paper's results indicate that FIPAPs for economy classes are not always parallel to their influence on passenger loyalty. Therefore, airlines are firstly recommended to make clear if they aim to influence passenger airline preferences or enhance passenger loyalty by their service or in their marketing communication campaigns. This recommendation applies to targeting both current passengers and prospective passengers. To create passenger loyalty as a primary purpose, it is suggested that they focus on in-flight experience, schedule convenience, and punctuality in their marketing campaigns regardless of their airline business models. However, being a full-service airline does not increase the influence of FIPAPs on passenger loyalty except for affordability. Therefore, full-service airlines are recommended to keep and develop their leadership on schedule convenience, punctuality, and in-flight experience factors to attract prospective passengers and ensure passenger loyalty. They are also recommended to provide special discounts to existing passengers to enhance passenger loyalty.

In contrast, it is suggested that low-cost carriers focus on factors influencing passenger preferences for their economy classes instead of creating loyalty. Furthermore, they are recommended to pay significant attention to punctuality in order to reduce latency periods and delays at airports by reoptimizing the time between two flights. If necessary, they should make these periods longer, as full-service airlines do. They are also recommended to focus on schedule convenience and put their flights on peak demand hours even if this creates extra costs instead of focusing on the ticket price. In line with this, they are recommended to focus on factors influencing passenger airline preferences, such as assurance, booking experience, and affordability in their marketing campaigns instead of creating passenger loyalty.

Limitations and Suggestions for Further Research

Some limitations need to be considered while evaluating the results of this paper. First, the distance between departure and arrival destinations was ignored while choosing respondents. However, FIPAPs may differ according to flight distance. For example, the influence of in-flight experience on passenger preferences may be more significant on long flights. In contrast, the influence of affordability on passenger preferences may be stronger on shorter flights. Another limitation of the paper is related to sampling and population. Data were collected only from passengers flying from/to the two airports in Istanbul, Turkey. Future research including flight distance as a moderating variable in a similar research model and testing the model by collecting data from passengers flying from/to different airports in different geographical areas might generate more interesting results. Another limitation is that the data were collected from those who had just traveled or would soon travel, but no check

was made regarding differences in behavioral profiles. There could be significant differences between those two groups of passengers. However, the paper did not test possible differences since the researchers had not thought about this in time. Researchers planning to conduct similar research are recommended to add this as a control variable to their research. Finally, the effect of FIPAPs on loyalty may be mediated by some variables, such as perceived value and satisfaction. Future research would do well to include those mediating variables in their research models.

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Appendix 1: Statements in the questionnaire

Passenger Loyalty	I am planning to keep traveling with this airline
	Overall, I am satisfied with traveling with this airline
	I recommend this airline to others
In-flight Experience	Quality of in-flight food and drinks
	Helpfulness of flight attendants
	Variety of in-flight food and drinks
	In-flight entertainment facilities (video, journal etc.)
	Comfort of aircraft
	Benefits of the loyalty program
	Well-qualified cabin crew
Assurance	A clear history regarding accidents
	Flight Safety and Security
	A new and well-maintenanced fleet
Schedule Convenience	Always having a flight
	Always having direct flights
	The convenience of flight hours
	Possessing a large fleet
Booking Experience	The convenience of online seat selection.
	The convenience of online check-in
	A perfect service giving information about the flights
Punctuality	Flight punctuality
	Short Latency Period During Take-off & Landing
Affordability	Early-booking discounts
	Installment opportunities in payment
	Price advantage with campaigns
	Low ticket prices
Excluded Statements	The attitude of cabin-crew
	Aircraft hygiene
	Free baggage allowance

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RESEARCH ARTICLE

Do Employees in Turkey Intend to Telework After the Pandemic?

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Abstract
Most employees in Turkey have become familiar with teleworking during the pandemic. This study aims to find the Turkish employees' motivation and commitment levels regarding their intention to telework after the pandemic. The mixed method of research with an exploratory sequential strategy with QUAL → QUAN design was used to explore and explain the motivation and commitment factors regarding the intention to telework after the pandemic in Turkey and to develop a scale. Grounded theory, exploratory factor analysis, one-way ANOVA, and independent samples t-tests were used. The results indicated that age groups affected the motivation and commitment and extrinsic motivation regarding the intention to telework after the pandemic, and education levels affected the general motivation and commitment and intrinsic motivation. As education and teleworking experience levels increased, motivation and commitment and intrinsic motivation regarding the intention to telework after the pandemic increased. Motivation and commitment and intrinsic motivation levels of the employees of companies applying teleworking systematically were higher than the employees who teleworked compulsorily during the pandemic without an adaptation process. Women's extrinsic motivation regarding the intention to telework after the pandemic was higher than men's. The motivation and commitment levels of teleworkers were significantly higher than those of non-teleworkers. The data strongly suggested that childless participants had significantly higher motivation and commitment and intrinsic motivation regarding the intention to telework after the pandemic compared to the parent participants.

Keywords
Teleworking, Teleworking Intention After Pandemic, Motivation, Commitment, Mixed Methodology

Introduction

Since the pandemic, an increasing number of employees in Turkey have begun working remotely as teleworkers, yet it has been due to a mandatory transition (Deloitte, 2020).

The compulsory and rapid increase in teleworking with the crisis process is expected to have a modifying and lasting effect on working strategies. Instead of a full return to the traditional working model, a shift to a hybrid working model is expected after Covid-19 (Place,2021; Everett, 2021; Alipour, Falck & Schüller, 2020).

For the working strategy selection, Fouladgar, Yazdani, Zavadskas & Haji (2012) proposed a model including the evaluation of indicators such as benefits (profit, credit, flex-

ibility, sustainability, extensibility), opportunities (financial facilities, previous knowledge, existing equipment), costs (initial capital value, the existence of competition, the need of the skilled labor force, the need for new technology), and risks (financial risk, risk of time delay, demand risk, operating risk). Therefore, before the decision to switch to a permanent remote working model after Covid-19, it is important to evaluate the satisfaction of employees to be able to evaluate the new working strategy, especially taking into consideration factors such as sustainability, previous knowledge, the existence of competition, and the need for a skilled labor force. The organizational investment in highly skilled labor is expected to increase due to their contribution to organizational productivity even under the most difficult conditions such as the Covid-19 pandemic (Kramer & Kramer, 2020). According to McKinsey (2020) also, the demand for skilled employees and workers will grow in Europe in the near future. …. Economies based on a highly skilled and educated workforce seem to be the most sustainable ones (Grigorescu & Nicolae, 2020; Ma, 2020; McDonald &Worswick, 2015). So, it can be predicted that after the acceleration of the digitalization process that has increased even more with the pandemic, talent hunting may increase for employees who have been able to adapt to the new normal more easily and have digitalization competencies. Therefore, measuring employee satisfaction regarding the teleworking process where a mandatory transition during Covid-19 was made, is critical, especially for the loyalty of talented employees. Yet, the focus of talent management is on employee attraction, development, and retention (van den Broek, Boselie & Paauwe, 2018).

Teleworking can have positive and satisfactory results for employees and organizations. It provides flexibility for employees, eliminates the stress of commuting to a central office, and helps work-life balance (Donnelly & Johns, 2021; Tahlyan et al., 2022; Vrchota, Maříková, & Řehoř, 2020). Yet teleworking can also be disadvantageous: there may be a fear of falling behind in effectively mastering processes compared to those in the office due to having less visibility and as a result, there is the risk of being the first to be dismissed during crisis periods.[1] There can also be a decrease in job satisfaction, remote monitoring challenges (Swisher, 2019; Walentek, 2021), work coordination problems (Choi, 2020), performance monitoring problems (Kurland & Bailey, 1999; Florea & Florea, 2021), isolation from colleagues (Matei & Mindrican, 2021; Nakrošienė, Bučiūnienė, & Goštautaitė, 2019) and the fear of limited opportunities for promotion (Cooper & Kurland, 2002; Maslowski, 2018; Swisher, 2019).

Taking into consideration the pros and cons of teleworking and the importance of talented employees' commitment, the question arises whether teleworking satisfied employees during the pandemic or not. So how has employees' intention to telework been affected by the pandemic process? Goodermote (2020) suggests a careful implementation of teleworking enabling increased productivity and job satisfaction while decreasing isolation. However, the

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1 Why Telecommuting Jobs Will Increase (online), http://workdesign.co/2012/01/why-telecommuting-jobs-will-increase/, Date of access: 11 July 2013

implementation of teleworking in Turkey was rapid and mandatory due to Covid-19. The first case of Covid-19 in Turkey was detected on 11.03.2020 and Covid-19 was declared a global pandemic by the World Health Organization (WHO) on March 11, 2020 (Cucinotta & Vanelli, 2020). Since this, there has been a compulsory transition to teleworking. Although teleworking started before the pandemic in Turkey, teleworking before the pandemic was a way of working that had just started to be implemented and had been adopted upon request and step by step. However, with the compulsory transition of the working style after the pandemic, there has been an increase in the number of teleworkers and teleworking has been newly experienced by more employees than before the pandemic. The vast majority of employees in Turkey have experienced and recognized the way of working remotely due to the pandemic. Therefore this study was carried out to measure the motivation and commitment of employees in Turkey related to their intention to telework after the pandemic. This is a critical lacuna to address since most of the employees in Turkey have also experienced teleworking during a serious crisis which affected the daily lives of people, and their psychology and caused many hassles that many had not experienced before (Karakose & Malkoc, 2021). For this reason, Deloitte Consulting Company (Deloitte) also conducted research about the transition to teleworking within 15 days after the pandemic across 17 provinces in Turkey to assess the adaptation to this new style of working (Deloitte, 2020).

It is known that national cultures have an impact on the adaptation to teleworking both on the side of managers and employees. Findings show that cultural practices (power distance, individualism/collectivism, uncertainty avoidance, and future orientation) at the national level predict management practices (Hofstede & Peterson, 2000; Peretz & Fried, 2012), and we also know that employees' cultural values influence how employees respond to different work models (Hofstede, 2001; Taras, Steel, & Kirkman, 2011; Adamovic, 2022). In the literature, national culture has been identified as one of the explanations for the cross-country differences in the adaptation to teleworking and diffusion (Peters & Den Dulk, 2003; Raghuram, London, & Larsen, 2001). Power distance influences managers' acceptance of teleworking. Teleworking is also seen as more in line with cultures characterized by higher levels of individualism because it generates empowerment. In teleworking, the direct task control systems are weakened so there is an uncertainty associated with teleworking. Teleworkers may behave opportunistically, and this is a risk (Peters, Ligthart, Bardoel & Poutsma, 2016). In cultures characterized by high levels of uncertainty avoidance, mutual trust between employers and employees is relatively low. Managers see imposing strict rules and regulations as a way to reduce uncertainty and emphasize the need for remote work regulations. This is a source of negative impact on employee motivation (Peters, Bleijenbergh & Oldenkamp, 2009). According to the results of Hofstede's study in 1980, Turkey has a collectivistic culture, and the levels of uncertainty avoidance and power distance are high. Taking into consideration these results teleworking practices may be expected to be reduced in the long term. However, in

the short term, the main contribution of this research is to investigate the current motivation and commitment of employees to the intention of teleworking in the Turkish cultural context during the post-pandemic period. The situation was similar in Romania, the United Arab Emirates, Saudi Arabia, the Netherlands, and Canada, and similar research was conducted for a comprehensive understanding of the well-being of teleworkers and the influencing factors of teleworking as well (Negruşa & Butoi, 2022; Aboelmaged & Elamin, 2009; Almubarak, et al., 2022; Ton, et al., 2022; Parent-Lamarche & Boulet, 2021). In the study conducted in Romania, parental status tension was determined in the case of teleworking during the pandemic (Negruşa & Butoi, 2022). In the research conducted in the Netherlands, the well being of the families with young children was reported to be relatively lower according to the other non-parents, and the ones who had teleworking experience before were reported to be more positive about this working style and wanted to telework more after the pandemic compared to before (Ton, et al., 2022). Marital status tension with teleworking was reported in the research done in Saudia Arabia during Covid-19 and also in this study women were reported to have a more positive experience than men related to teleworking (Almubarak, et al., 2022). Aboelmaged and Elamin (2009) conducted a survey assessing differences between the well-being of teleworkers among demographic factors. They concluded that gender, marital status, profession and residence were influencing factors for teleworking choices. Women were found to be more motivated. Married employees and employees who had longer commutes were reported to prefer teleworking.

As a result, socio-demographics that are effective on the satisfaction level of teleworking were added to the framework of this study to report the intention to telework after Covid-19 in Turkey. In this study both marital status and parental status tension due to teleworking was expected due to the sudden shift to teleworking and most of the employees and firms were caught unprepared. Married couples and parents suddenly could not adapt their living spaces, and technological facilities to teleworking mode. Different satisfaction levels were expected for different groups of age and gender in this study. Since Turkey has a patriarchal society, the study started with the estimation that men would be less satisfied with remote work. Also, a significant satisfaction differentiation was expected especially in between the young and old groups due to the digital competency differences between them. The findings of the influence of demographic variables on the teleworking intention will provide some insights both for new research and for the sector managers and human resources managers in Turkey to support the employees' challenges by company policies and employee assistance programs tailored according to the influence of demographic variables (marital status, parental status, position, experience and etc.) and by redesigning the jobs according to the situational needs of the employees to increase employee well being and efficiency. Also, this study presents a tool for researchers and professional managers that will enable the satisfaction survey of the teleworkers every year and the wellbeing of teleworkers to be compared from year to year which will contribute to the sustainability of a teleworking system in Turkey.

Method

Participants

The study includes two studies, so it was completed in two phases. The first phase of research is a scale development study carried out with 515 participants by transforming the expressions in the qualitative study (Özcan, 2017) conducted with 21 participants, 16 of whom worked remotely and 5 of whom did not work remotely, in 2016 and 2017.

In the second phase of research, 607 questionnaires were collected, and, again, 515 questionnaires were included in the study after excluding the double-filled and incompletely filled questionnaires. 52.82% of the participants were female, 47.18% of them were male, 64.27% of them were married, 35.73% were single, 55.34% of them had children, and 44.66% of them were childless. Regarding the educational background: 7.38% were high-school graduates or had associate degrees, while 56.12% of them were at the undergraduate education level and 36.50% of them were at the postgraduate and higher education level.

As for the organizational identifiers of the participants in the institutional context, 75.92% of the participants were from national companies and 17.48% of them were from foreign companies. 6.60% of the participants' company capital structure was joint national and foreign. 67.18% of the participants were from the service sector, and 32.82% of the participants were from the production sector. 50.49% of them were employees, 35.92% of them were managers and 13.59% of them were from the top manager position group. Regarding the total experience of the participants: 12.43% of the participants had less than 5 years of experience, 18.45% of the participants' experience was between 5 – 10 years (including the 5th year), 15.34% of them had experience between 10 – 15 years (including the 10th year), 17.28% of them had experience between 15 – 20 years (including the 15th year), 18.06% of them had experience between 20 – 25 years (including the 20th year), and, lastly, 18.45% of them had over 25 years of experience.

18.45% (n=95) of the participants were in the 21-30 age range, 18.25% (n=94) were in the 31-35 age range, 17.86% (n=92) were in the 36-40 age range, 20.58% (n=106) were in the 41-45 age range, while 24.85% (n=128) of them were 46 years old and above.

The teleworking experience of 42.52% (n=219) of the participants was reported to be 0 years; the teleworking experience of 29.90% (n=154) of the participants was between 0-1 years; 20.19% (n=104) was 1 year; and finally, 7.38% (n=38) of the participants had remote working experience of more than 1 year. When the teleworking experience is compared with the duration of the pandemic in the period of the survey, on a monthly basis, it is seen that the total number of participants who started working remotely before the pandemic (before 11.03.2020) was 165 (32%). These participants declared that they had been working remotely for 7 months or more.

Materials

Descriptive data such as gender, age, education, marital status, parenthood status, the sector they work, the capital structure of the enterprises they work for, their positions, total experience and teleworking experiences, teleworking styles and teleworking preferences of the participants included in the research were collected using the demographic information part of the questionnaire.

The second part of the questionnaire is the **Teleworking Intention Scale** ratings which were made on a 5-point Likert scale ranging from "I strongly disagree" (1) to "I strongly agree" (5). This scale was developed in the first stage of the research by making use of the statements in the qualitative thesis study by Özcan (2017). The first study was done to develop a scale as an instrument to measure the motivation for teleworking after the pandemic, for which there was a gap in the literature. In order to understand the factor structure of the Teleworking Intention Scale, an exploratory factor analysis was performed. In this study, the Principal Components Analysis was used, and since more than one factor was obtained as a result of the analysis, the rotation technique of Direct Oblimin which reveals the structure of the factors more clearly was used. The reason why the Direct Oblimin rotation technique is preferred is based on the assumption that the relationships between the factors may be high. However, it was seen that these relations were less than 0.3, and the varimax method was also found to be appropriate for this analysis (Bursal, 2017). All the items were included in the factor analysis, and the items that had high factor loadings under more than one factor, remained alone or that had a very low factor loading were removed from the scale one by one, and the remaining items were reintroduced into the factor analysis. As a result of the analysis, the Kaiser-Meyer-Olkin coefficient was found to be 0.915 in the factor analysis and Bartlett's Test of Sphericity showed that the factors were significant with $p<.05$. The items were gathered under two main factors: the extrinsic motivation for teleworkers and the intrinsic motivation for teleworkers. The Cronbach's alpha reliability coefficient of the created scale was found to be 0.883 which is highly reliable (Güriş & Astar, 2019). Cronbach's Alpha values measured for intrinsic motivation and extrinsic motivation sub-scales were, respectively, 0.936 and 0.430.

"Beeckman et al. (2010) report the alpha values for the entire set of items and for the individual subscales. This approach, although seen often in the literature, is logically inconsistent. If alpha for the entire scale is high, it implies that the scale is tapping only one, homogeneous construct. Therefore, it is not logical to look for or talk about subscales; either the total scale is homogeneous or it is composed of individual, supposedly unrelated, subscales. If the subscales make sense, a high a-value for all of the items simply reflects the length of the scale, not its composition. Alpha is a function of the number of items in instruments. Empirical evidence suggests that if an instrument or scale has many items it can have high values even when the average correlation among items is very small and different constructs are measured." (Kottner & Streiner, 2010).

"When other factors are held constant, computed alpha, increases with the total number of items in the original scale .... decreases with the increasing sample size and increases with the average true inter-item correlation among the items." (Kopalle & Lehmann, 1997).

In social sciences, Cronbach's α value greater than 0.6 can be regarded as a satisfactory reliability (Malhotra & Birks, 2000:307). The only factor with a Cronbach's α value under 0.6 is extrinsic motivation (0.430). However, when this empirical evidence is considered in tandem, the Cronbach's alpha value of the extrinsic motivation subscale was tolerated considering that the subscale contained few items, the sample size was higher than 500, and the total scale had a high validity value (0.883). The factor structure of the scale, the variance explained by factors, and the reliability coefficients are presented in the result part.

Procedure and Methodology

First of all, ethics committee approval was obtained for the research. Ethical approval for this research was given by the Istanbul University Research Ethics Committee, with the letter dated 10.07.2020 and numbered 2020/86 – 30104.

An exploratory sequential mixed method research design of QUAL → QUAN was used in this research. For developing new instruments, exploratory designs are beneficial (Harrison, 2013).

In the first phase, the results of the qualitative research, in which the factors affecting the motivation of teleworkers and the negative and positive factors affecting the commitment of teleworkers were explored (Ozcan, 2017), were used and a scale was developed. In the second phase the quantitative research was done to measure the teleworking intention after the global pandemic and the commitment to teleworking working arrangements. The weight of the research is equal. In mixed method research, weight occurs practically and either the quantitative or qualitative phase of research is emphasized first but sometimes one form of data is used by the one form of data on purpose to support the larger study as in some experimental trials (Creswell 2009). This is also the case in this research.
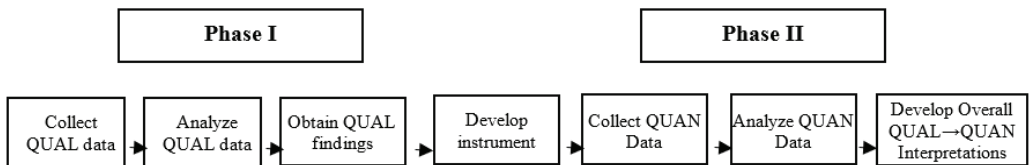
Figure 1. Method flow chart of exploratory mixed method design (Polit & Tatano Beck, 2012).

In the first phase, an instrument specific to Turkish culture was developed and important motivation and commitment variables related to teleworking intentions after the pandemic were explored and identified to study quantitatively to generalize results to different groups (Morse, 1991; Creswell & Clark, 2018). Between the samples of the initial and the second research, there is a parallel relationship (Collins, Onwuegbuzie & Jiao, 2007), the samples in the two strands are completely different but they were drawn from similar populations (Polit & Tatano Beck, 2012). The integration of two strands was achieved at the interpretation stage.

Study 1 – First Phase of Mixed Method Research

The quoted expressions from Ozcan's (2017) thesis in the scale were produced by snowball sampling method and triangulation was applied to increase the validity of the conclusions, therefore sampling was intentional. "Purposeful sampling in grounded theory means that the researcher selects individuals to study based on their contribution to the development of the theory." (Palinkas, et al., 2015). Typical cases purposeful sampling strategy was used (Luciani, Campbell, Tschirhart, Ausili, & Jack, 2019) and the respondents' positions, educational levels, experiences, locations, gender, and also family status were evaluated to provide data saturation and to support triangulation (Polit & Tatano Beck, 2012; Carter, Bryant-Lukosius, Dicenso, Blythe, & Neville, 2014). Therefore the expressions 'validity were high and were generated from Turkish teleworkers 'ideas so these expressions were considered appropriate to develop a teleworking intention scale so as to have tool appropriate to the Turkish culture.

Study 2 – Second Phase of Mixed Method Research

In the second phase of mixed method research, SPSS 20.00 Program was used in the analysis of the data. Research data were collected between 29.08.2020 and 12.10.2020 which is between the 5th and 7th months of the pandemic.[2]* The research in the second phase was conducted with office workers who work in different organizations in different sectors in Turkey and who can switch to full-time or part-time teleworking and with both pre-pandemic old teleworkers and post-pandemic new teleworkers. The data were collected by a snowball sampling method on the internet via Google Docs between August and October 2020 during the pandemic process.

Results

In the first phase of the study, factors motivating employees in teleworking, shown in Table 1 (Ozcan,2017), were mainly categorized under social relationship-relational orientation to work and other people; extrinsic motivation-tangible rewards, advancement opportunities, work environment and conditions of work; intrinsic motivation- action by an employee who is appreciated by the opportunity to use one's ability, and being treated in a considerate manner (Süzen, 2020).

Table 1
Factors Motivating Employees in Teleworking

Categories & Codes	Frequency	%
Social Relationship	17	51.52%
Close support of the teammate	8	47.06%

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2   * https://covid19.saglik.gov.tr/TR-66494/pandemi.html

Categories & Codes	Frequency	%
Good communication with the manager	7	41.18%
Trying to create a common team spirit	2	11.76%
Extrinsic Motivation	11	33.33%
No obligation to go to work	9	81.82%
The first opportunity to work remotely	2	18.18%
Intrinsic Motivation	5	15.15%
The manager trusts the employee and makes you feel this	3	60.00%
Employee empowerment and initiative	2	40.00%
Total (Valid)	33	100.00%

Source: (Ozcan, 2017)

Similarly, factors of teleworking associated with commitment were mainly categorized under factors of telecommuting increasing commitment and factors of telecommuting decreasing commitment subcategories of which are provided in Table 2 (Ozcan,2017). Categories were structured according to Mullin's categorization (Teryima, Timothy, Faajir, John & Vivien, 2016; Rahman, Osman-Gani, Momen & Islam, 2015).

Table 2
Factors of Teleworking Associated with Commitment

Categories & Codes	Frequency	%
Teleworking is Directly Associated with Commitment	**27**	**81.82%**
Factors of Telecommuting Increasing Commitment	**13**	**39.39%**
The positive effect of providing the opportunity to work remotely in special cases	6	18.18%
Time and relaxation opportunity provided by teleworking	3	9.09%
Providing all kinds of fringe benefits	3	9.09%
The environment of concentration enabled by teleworking	1	3.03%
Factors of Telecommuting Decreasing Commitment	**14**	**42.42%**
Being away from the team and interaction	9	27.27%
Breaking with corporate culture	4	12.12%
Unwillingness to telework if the workload is heavy	1	3.03%
Teleworking is not Directly Associated with Commitment	**6**	**18.18%**
Total (Valid)	**33**	**100.00%**

Source: (Ozcan, 2017)

The research was started by revealing the condition that the data satisfied the normal distribution condition. In this study, the representation of the data's conformity with the normal distribution was checked with the skewness and kurtosis values of the 12 variables. Here, it was determined that the kurtosis value of only 5 variables and the skewness value of only 1 variable were slightly above 1 (maximum 1.354). The skewness and kurtosis values of all other variables remained between -1 and +1. "A kurtosis value between ±1.0 is considered

excellent for most psychometric purposes, but a value between ±2.0 is in many cases also acceptable, depending on the particular application." (George & Mallery, 2010). "Also for large samples, we can take comfort from the central limit theorem." (Field, 2016). Therefore, it can be accepted that the data are in accordance with the normal distribution (George & Mallery, 2010). The mean, standard deviation, kurtosis and skewness values of the variables of the study are presented in Table 3 below.

Table 3
Means & Skewness and Kurtosis Values of Research Variables

Item Number	Research Variables	N	Mean	Std. Deviation	Skewness Statistic	Kurtosis Statistic
1	Even if my teammates have close support, I do not want to work remotely.	515	3.82	1.321	-0.836	-0.547
2	Even if I have good communication with my manager, I do not prefer to work remotely.	515	3.82	1.33	-0.873	-0.502
3	Although there is a common team spirit in our team, I do not prefer to work remotely.	515	3.81	1.317	-0.863	-0.496
4	The fact that there is no obligation to go to work in remote work does not affect me.	515	2.79	1.436	0.217	-1.3
5	When the teleworking opportunity is given, I don't see it as an opportunity.	515	2.7	1.515	0.347	-1.354
6	Although my manager trusts me for teleworking, I do not prefer to work remotely.	515	3.72	1.386	-0.744	-0.806
7	Even if the necessary authority and initiative is given, I do not want to telework.	515	3.76	1.382	-0.8	-0.721
8	To be given the opportunity to work remotely in special situations (birth, education, etc.) does not motivate me.	515	4.15	1.196	-1.354	0.751
9	The time and relaxation opportunity provided by telework is not something that impresses me.	515	3.49	1.412	-0.482	-1.099
10	Even though I have all kinds of fringe benefits, I do not want to work remotely.	515	3.89	1.351	-0.952	-0.438
11	Being away from the company culture while working remotely does not affect me.	515	2.82	1.368	0.225	-1.171
12	In remote work, I cannot work away from the team and interaction.	515	3.37	1.355	-0.358	-1.099
	The mean of motivation and commitment variables = Items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	515	3.5125	0.93062	-0.678	-0.344
	The mean of the motivation and commitment variables collected in the 1st factor = intrinsic motivation= Items 1, 2, 3, 6, 7, 8, 9, 10, 12	515	3.7599	1.0891	-0.737	-0.479
	The mean of extrinsic motivation in the second factor = Items 4, 5, 11	515	2.7702	0.89509	0.322	-0.159
	Valid N (listwise)	515				

Exploratory factor analysis was applied to the Teleworking Intention Scale after the confirmation of the normal distribution of the data and the construct validity of the scale was checked. The factor structure of the Teleworking Intention Scale, the variance explained by the factors, and the reliability coefficient of the scale are presented in Table 4.

Table 4
The Factor Structure of The Teleworking Intention Scale

Factor Name	Items	Factor Loading	Factor Loading	Variance Explained	Cronbach α
Intrinsic Motivation	Even if my teammates have close support, I do not want to work remotely.	**.906**		52.806	0.936
	Even if I have good communication with my manager, I do not prefer to work remotely.	**.911**			
	Although there is a common team spirit in our team, I do not prefer to work remotely.	**.928**			
	Although my manager trusts me for teleworking, I do not prefer to work remotely.	**.905**			
	Even if the necessary authority and initiative is given, I do not want to telework.	**.922**			
	To be given the opportunity to work remotely in special situations (birth, education, etc.) does not motivate me.	**.527**			
	The time and relaxation opportunity provided by telework is not something that impresses me.	**.565**			
	Even though I have all kinds of fringe benefits, I do not want to work remotely.	**.904**			
	In remote work, I cannot work away from the team and interaction.	**.641**			
Extrinsic Motivation	The fact that there is no obligation to go to work in remote work does not affect me		**.731**	12.225	0.430
	When the teleworking opportunity is given, I don't see it as an opportunity.		**.580**		
	Being away from the company culture while working remotely does not affect me.		-.637		
Kaiser-Meyer-Olkin	.915		**Total**	**65.031**	
Cronbach's Alpha	0.883				
Bartlett's Test	Yakl. Ki-Kare Sd anl.	4858.880 66 .000			

In the second phase of the study, the data analysis was continued with variance analyses: one-way Anova, Welch, Scheffe, Tamhane analyses and independent samples t-test analyses were used to determine the differences in the levels of general motivation and commitment, intrinsic motivation and extrinsic motivation between the groups.

Employees' Teleworking Motivation According to Age

Since the age of the participants had a normal distribution, an ANOVA test was conducted to determine whether there was a significant difference between motivation and commitment.

As a result of the Levene test, it was determined that the homogeneity of variance, which is the prerequisite of the ANOVA test, was provided in the dimensions of motivation and commitment, intrinsic motivation, and extrinsic motivation (p>0.05).

As a result of the ANOVA analysis presented in Table 5, it was determined that the motivation and commitment levels of teleworkers differ according to age. (F=2.698, p<.05)

As a result of the Scheffe test results, it could not be determined among which groups this difference occurred. However, regarding the averages from descriptive statistics, the age group with the lowest motivation and commitment level was 46 and over (mean=3.34) and the highest motivation and commitment level belonged to the 36-40 age group (mean=3.67). However, these differences between the means are not statistically significant, they can just be attributed to coincidences.

When ANOVA test results regarding whether there was a significant difference in the extrinsic motivation levels whose variances were homogeneously distributed were analyzed, it was seen that there occurred a significant difference among the age groups (F=2.831, p<.05).

A Post-hoc- Scheffe test was applied to determine among which age groups extrinsic motivation levels vary. Regarding the Scheffe test results, there was no value under 0.05 among the significance levels of the age groups in extrinsic motivation. Therefore, although extrinsic motivations differ according to age groups, it could not be understood from which groups this was caused by the post-hoc analysis. However, the age group with the lowest mean (mean: 2.66) for extrinsic motivation level was 46 years and older, while the age group with the highest extrinsic motivation level is 36-40 years (mean: 2.99). Differences among them were not statistically significant so this can be attributed just to the coincidences.

Employees' Teleworking Motivation According to Educational Status

Since the participants' educational levels displayed a normal distribution and their variances were homogeneously distributed (Levene test: p>0.05), an ANOVA test was applied to determine whether there was a significant difference between variables according to educational levels. And according to the result presented in Table 5, within the frame of teleworking intention after the pandemic, there was a significant difference in motivation and commitment (F: 4.304, p <.05) and intrinsic motivation (F: 4.014, p<.05).

In order to determine between which groups the motivation and commitment and intrinsic motivation differed according to educational levels, the Scheffe test was performed because their variances were homogeneous. As a result of the Scheffe multiple comparisons test, it was observed that the motivation and commitment levels of the participants at high school and associate degree education levels and those at undergraduate and postgraduate and higher education levels differed significantly (p<.05). Participants

at high school and associate degree education (mean: 3.11) reported significantly lower ratings on the dimension of motivation and commitment than did the participants at undergraduate education level (mean: 3.52) and at postgraduate and higher education level (mean: 3.59).

When examining among which educational levels the difference was in terms of intrinsic motivation, it was seen that the difference was again between the participants at the high school and associate degree education level and the participants at the undergraduate and postgraduate and higher education levels. (p<.05). Regarding intrinsic motivation, the level of the participants at the high school and associate degree education (mean: 3.30) was significantly lower than the participants at the undergraduate education level (mean: 3.77) and the participants at the postgraduate and higher education levels (mean: 3.84).

Employees' Teleworking Motivation According to Total Experience Levels

Since participants' total work experience displayed a normal distribution and their variances were homogeneously distributed, an ANOVA test was conducted to determine a significant difference between variables regarding teleworking intention in terms of motivation and commitment, intrinsic motivation, and extrinsic motivation, but according to the results presented in Table 5, no significant difference was determined. (p>.05).

Employees' Teleworking Motivation According to Teleworking Experience Levels

When the situation of significant differentiation in terms of motivation and commitment, intrinsic and extrinsic motivation according to the teleworking experiences of the participants was examined, it was found that the variance homogeneity, which is one of the prerequisites of the ANOVA test, could not be achieved at the level of motivation and commitment, intrinsic motivation according to the results of the Levene test (p<.05), but it was provided at the extrinsic motivation level (p>.05).

Therefore, in terms of motivation and commitment and intrinsic motivation, the Welch test was used instead of the ANOVA test to specify the differentiation status of the teleworking intention according to the teleworking experiences of the participants.

According to the Welch test results presented in Table 5, it was observed that there was a significant difference between motivation and commitment and intrinsic motivation of employees in terms of teleworking experience (p< .05). In order to see between which groups the difference was, the Tamhane test was utilized.

According to the results of the Tamhane test, there was a statistically significant difference between the participants who did not experience teleworking before (mean: 3.38) and those who have worked remotely for more than 1 year (mean: 3.95) in terms of motivation and

commitment. Again, in terms of motivation and commitment, there was a significant difference between the participants who worked remotely for more than 1 year (mean: 3.95) and those who worked remotely for 1 year (mean: 3.42).

It can be emphasized that when the Tamhane test results were reviewed with regards to intrinsic motivation it was seen that there was also a significant difference between participants who have not teleworked before (mean:3.61) and the participants who have worked for 1 year and more (mean:4.26) in terms of intrinsic motivation.

For the extrinsic motivation level, the precondition of homogeneity of variance was met (p>.05) and the differentiation between variables based on teleworking experience levels was tested according to the ANOVA analysis, the results of which can be seen in Table 5. However, it was seen that there was no differentiation in terms of extrinsic motivation among employees with different teleworking experiences (p>.05).

Although it is not statistically significant, when we look at the averages in terms of extrinsic motivation, the extrinsic motivation average of employees who have not teleworked before was 2.69; the extrinsic motivation average of those with 0-1year experience was 2.86, and the extrinsic motivation average of those with 1 year of experience was 2.72; the extrinsic motivation of teleworkers for 1 year or more was 3.01, but this result can just be attributed to coincidences.

In terms of motivation and commitment, there was a statistically significant difference between participants who have not teleworked before and those who have teleworked for 1 year and those who have teleworked for more than 1 year. In Ozcan's (2017) qualitative study, supporting the result of the quantitative research in the 2nd phase, two expert-level participants with 3 years and 9 months of teleworking experience, respectively, expressed their satisfaction with teleworking as follows:

"While others get up early in the morning to get ready for work, you don't have such a problem. When they start to work, you don't have to get up. So, we have a chance to have enough sleep; It gives you such an advantage." (Ozcan, 2017).

However, it should be considered that teleworking has not been practiced for many years in Turkey. Only 4.27% (n=22) of the participants in the 2nd phase of research were teleworkers for 4 or more years. On the other hand, in Ozcan's (2017) qualitative study, the emphasis of one of the executive-level participants, who had been working remotely for 5-7 years and has internalized the way of working remotely, is standing out:

"What is out of sight, is out of mind, is also true for this case. As a result, I think it seriously reduces the commitment to your workplace. That's exactly what happened to me… the first 2 years I didn't experience anything like it. …but for the last two years, I have had serious problems with belonging. If you are a dedicated, goal-oriented, hard-working and challenging person, you can go to the point of problem-solving and new strategy creation. This is the point where you can improve yourself more. But if both you work remotely and you are goal-oriented, hardworking and challenging, you may tend to withdraw. This is also

a risk. So this is a disadvantage of remote working….. Remote working requires 2-3 times more effort than face-to-face working to get to the point of problem-solving and new strategy creation so that you can remain calm. When it is on the phone or the computer, you may want to say why am I telling this to the same man again and not tell it at all." (Ozcan, 2017).

Therefore, when compared with the qualitative research result quoted in the first phase, it is seen that as the duration of teleworking increases, problems with motivation and commitment increase at the same time. Much as the fact of ''no obligation to go to work'' is emphasized as a motivation-increasing factor in other samples in the 1st phase, an executive with more than five years of teleworking experience and more than twenty years of total experience, competent in the field, highlighted that as the duration of teleworking increases, belongingness decreases and there also occurs serious problems. Therefore, as teleworking becomes more widespread in the following years, it is clear that it is needed to evaluate the satisfaction of employees depending on the duration of teleworking and the Teleworking Intention Scale is developed for this sake.

Employees' Teleworking Motivation According to the Reasons for Teleworking

When the situation of significant differentiation in terms of motivation and commitment, intrinsic and extrinsic motivation according to the reasons of teleworking for the participants was analyzed, the variance homogeneity, which is one of the prerequisites of the ANOVA test, could not be achieved at the level of motivation and commitment, intrinsic motivation according to the Levene test results at a significance level of 0.05 ($p<.05$), but for extrinsic motivation this condition could be met ($p>.05$).

Therefore, the differentiation status of the participants in terms of motivation and commitment, intrinsic motivation according to the reasons for teleworking was analyzed with the Welch test instead of the ANOVA test.

According to the Welch test results presented in Table 5, there was a significant difference in motivation and commitment and intrinsic motivation levels of employees in terms of reasons for teleworking ($p< .05$). Using the Tamhane test, it was analyzed among which groups the difference was.

For the Tamhane test results, in terms of motivation and commitment, there was a significant difference ($p<.05$) between the participants whose company applied teleworking systematically (mean:3.93) and the participants whose right to work remotely was given part-time compulsory due to a social situation (Covid-19) (mean:3.49). Descriptives of motivation and commitment, intrinsic and extrinsic motivation variables in terms of the reasons for teleworking and the mean differences can be seen in Table 5. In the level of intrinsic motivation, a statistically significant difference was also found between the same two groups ($p<.05$). The mean of intrinsic motivation of participants who work in a company that applied teleworking

systematically was 4.31 while the mean of intrinsic motivation of participants who work in a company that applies teleworking as part-time due to a social reason (Covid-19) was 3.73; this difference was statistically significant.

An opinion in Ozcan's (2017) qualitative study that has the potential to explain the significant difference between motivation and commitment levels of participants who teleworked systematically and the participants who compulsorily teleworked due to Covid-19 is worth emphasizing the point of making sense of this numerical result:

''I have not many difficulties because of the settled system in my workplace. But, in an example I have heard, a company is new in teleworking; it continuously controls. There is a lack of confidence. People who have not worked like this before, have a fear of the system. 'I will send the person to Adana, Izmir from here, he will work remotely. What is he doing? What does he do? Fear of not knowing." They are afraid of the system. After all, it is the business results that must be discussed." (Ozcan,2017).

At the extrinsic motivation level with variance homogeneity, it was seen that there was no difference between the groups based on the ANOVA test results presented in Table 5.

Employees' Teleworking Motivation According to Gender

According to the findings obtained from the t-test based on gender difference which is presented in Table 6, it was found that the motivation and commitment and intrinsic motivation of the participants, whose variance equality was ensured, did not differ significantly according to their genders (p>.05); however, at the level of extrinsic motivation with equal variance, when the t-test findings were examined, it was seen that the extrinsic motivation of the participants about teleworking differed significantly according to their gender (p<.05). At the level of extrinsic motivation, the mean of women (mean: 2.85) was statistically significantly higher than the mean of men (mean: 2.67) as can be seen from the group statistics in Table 6.

Subfactors that increase extrinsic motivation in the 1st Phase were "no obligation to go to work'' and "first opportunity to work from home". In the 2nd phase of this quantitative research, 47.42% of the participants had kids. At this point, the following expression from Özcan (2017) study can explain the higher extrinsic motivation level of females.

''You can wake up more vigorous and dynamic in the mornings. You need more sleep when your child is small. You wake up more at night and you can't get a full sleep. When you wake up 1-2 hours late in the morning, exactly when the child is asleep, you can start the day more comfortably and in a more relaxed way." (Ozcan,2017).

Employees' Teleworking Motivation According to Marital Status

According to the marital status variable in the 2nd phase of research, whether there is a significant difference between the motivation and commitment, intrinsic motivation and extrinsic

Table 5
Comparison of Age, Educational Level, Total & Teleworking Experience Levels, Reasons for Teleworking

Variables	Motivation and Commitment			Intrinsic Motivation			Extrinsic Motivation		
	Mean (SD)	F	P	Mean (SD)	F	P	Mean (SD)	F	P
Age									
31-35	3.57 (0.89)			3.84 (1.06)			2.78 (0.83)		
36-40	3.67 (0.85)			3.90 (1.00)			2.99 (0.93)		
41-45	3.47 (0.95)	2.698	0.045	3.73 (1.14)	2.154	0.093	2.70 (0.84)	2.831	0.038
46 and Over	3.34 (0.99)			3.57 (1.14)			2.66 (0.98)		
Educational Level									
High School and Associate Degree	3.11 (0.89)			3.30 (1.05)			2.54 (0.76)		
Undergraduate Education Level	3.52 (0.97)	4.304	0.014	3.77 (1.13)	4.014	0.019	2.76 (0.91)	1.772	0.171
Postgraduate and Higher Educational Level	3.59 (0.86)			3.84 (1.02)			2.83 (0.89)		
Total Experience Levels									
0 - 5	3.5313 (0.88)			3.7535 (1.03)			2.8646 (0.82)		
5-10	3.6018 (0.92)			3.8994 (1.05)			2.7088 (0.92)		
10-15	3.4325 (0.94)	1.457	0.203	3.6399 (1.16)	1.675	0.139	2.8101 (0.82)	0.550	0.738
15-20	3.5833 (0.91)			3.8439 (1.04)			2.8015 (0.94)		
20-25	3.6093 (0.92)			3.8769 (1.09)			2.8065 (0.95)		
> 25	3.3158 (0.98)			3.5310 (1.12)			2.6702 (0.89)		
Teleworking Experience Levels									
0	3.3831 (0.99)			3.6114 (1.15)			2.6983 (0.90)		
Between 0 and 1 Year	3.6432 (0.92)	7.334	0.00	3.9027 (1.06)	6.737	0.00	2.8649 (0.94)	2.053	0.106
1 Year	3.4223 (0.82)			3.6538 (1.02)			2.7276 (0.78)		
> 1 Year	3.9539 (0.71)			4.2661 (0.86)			3.0175 (0.99)		
Reasons of Teleworking									
Teleworking is practiced systematically in my company.	3.9389 (0.64)			4.3136 (0.77)			2.8148 (1.01)		
The right to work remotely has been given to me due to my personal situation.	3.7500 (0.57)			3.9722 (0.67)			3.0833 (0.76)		
The right to work remotely has been given to all company employees for a temporary period due to a company-specific situation.	3.7061 (0.86)	5.195	0.003	3.9532 (1.10)	5.877	0.002	2.9649 (0.76)	0.984	0.400
The right to work remotely has been given compulsorily for a fixed time due to a social situation (Covid-19).	3.4985 (0.50)			3.7376 (1.10)			2.7812 (0.90)		

motivation levels in terms of post-pandemic teleworking intention was examined by the t-test. According to the Levene test results, homogeneity of variance was provided at the levels of motivation and commitment, intrinsic motivation, and extrinsic motivation (p>.05). However, the t-test results on marital status difference presented in Table 6, indicated no significant mean differences among motivation and commitment, intrinsic motivation, and extrinsic motivation levels of married and single participants at a significance level of 0.05. The mean values can be seen in Table 6.

Employees' Teleworking Motivation According to Teleworking Status

An independent samples t-test analysis was run and according to the results of the analysis which can be seen in Table 6, it is seen that the motivation and commitment and intrinsic motivation, whose variances were unequal, differ significantly according to the teleworking status (p<.05). As presented in Table 6, at the level of motivation and commitment, the mean of teleworkers (mean: 3.61) is statistically significantly higher than the mean of those who do not telework (mean: 3.38). At the level of intrinsic motivation, the mean of teleworkers (mean: 3.87) is statistically significantly higher than the mean of those who do not telework (mean: 3.61).

Employees' Teleworking Motivation According to Parental Status

The t-test was used to investigate whether the motivation and commitment, intrinsic motivation and extrinsic motivation levels, for which the variances were equal, differ according to parental status (p>.05). According to the results of the t-test analysis presented in Table 6, it is seen that just the motivation and commitment and intrinsic motivation of the participants differ significantly (p<.05) according to the status of having a child. At the level of motivation and commitment, the mean of the participants who do not have a child (mean: 3.61) is statistically significantly higher than the mean of the employees who have children (mean: 3.42). The mean levels are presented in Table 6. At the level of intrinsic motivation, the mean of the participants who do not have a child (mean: 3.87) is statistically significantly higher than the mean of the employees who have children (mean: 3.66).

The two views expressed in the qualitative research of Ozcan (2017) can satisfactorily explain the significant difference in motivation and commitment and intrinsic motivation levels regarding the post-pandemic intention to telework, according to the status of having children:

"Your chance to work with a child is very low. Today, for example, I would normally come home at 4 o'clock. But I preferred to come around 6 for example. I spent 2 hours somewhere to complete my immediate concerns. Then I came. Then I continued some correspondence at home, but things that I could do a little more comfortably and simply so that the child could come and sit on my lap. I prefer to sit somewhere else if I have to do the things that I must think hard. Otherwise, you lose your concentration. Then you cannot do that job as you wish."

"*For example, I am concentrating on a task, the bell rings, the child comes. This is what's happening. You prepare a document, the child takes it, tears it and throws it away. You cannot lock the door when you are at home together. If you are married, your wife may leave the child to you because you telework; these are true life experiences and information I got from my friends. These friends quit and preferred jobs with a fixed check-out time and an office environment. They moved to an office.*" (Ozcan, 2017).

Table 6
Comparison of Gender, Marital, Teleworking & Parental Status

Variables	Motivation and Commitment			Intrinsic Motivation			Extrinsic Motivation		
	Mean (SD)	F	P	Mean (SD)	F	P	Mean (SD)	F	P
Gender									
Women	3.5778 (0.91)	0.346	0.092	3.8199 (1.06)	1.112	0.186	2.8517 (0.89)	0.031	0.029
Men	3.4393 (0.95)			3.6927 (1.12)			2.6790 (0.90)		
Marital Status									
Married	3.4869 (0.92)	0.099	0.404	3.7382 (1.08)	0.067	0.545	2.7331 (0.89)	0.664	0.207
Single	3.5584 (0.96)			3.7989 (1.11)			2.8370 (0.90)		
Teleworker or not									
No	3.3843 (0.98)	7.621	0.007	3.6126 (1.14)	5.588	0.008	2.6994 (0.88)	0.448	0.115
Yes	3.6111 (0.88)			3.8732 (1.04)			2.8247 (0.90)		
Do you have a child or not?									
No	3.6178 (0.94)	0.019	0.021	3.8749 (1.08)	0.134	0.031	2.8464 (0.92)	0.997	0.083
Yes	3.4275 (0.92)			3.6671 (1.09)			2.7088 (0.87)		

Discussion and Conclusion

The pandemic affected people's lives negatively socially, physically, and economically all over the world (Karakose & Malkoc, 2021). In this process, serious changes and transformations took place in many areas. The pandemic also changed the working style in a compulsory way and teleworking was experienced by a large number of Turkish employees in Turkey after the pandemic. The number of teleworkers has increased sharply and compulsorily in a short time. This study was carried out to develop a scale and determine the teleworking intention of employees academically after the pandemic when they experienced remote work.

In order to find an answer to this research question, the present study extended the qualitative study of the thesis "A Qualitative Research Surveying the Effect of Telework on Working Life in Turkey" (Ozcan, 2017) to a quantitative study by using mixed methodology to fill the gap of a related scale in the literature. The main purpose of the first step was to develop a scale related to motivation for teleworking intention after the pandemic and its validity and reliability was demonstrated. The first factor in the scale was called intrinsic motivation and the second factor was called extrinsic motivation. So, this study generates a main contribution to the theory by presenting the tool of **Teleworking Intention Scale** to measure the telework-

ing intention of employees. Additionally, top managers and human resources managers can also use this tool to compare the motivation and commitment of teleworkers from year to year and apply appropriate politics accordingly to enable the sustainability of this working style.

The aim of the second leg of the study was to investigate the motivation and commitment of Turkish employees related to the teleworking intention after the pandemic and find the influence of demographic variables on the teleworking intention in Turkey. The sample distribution of the research is close to Deloitte's research applied within 15 days after the pandemic across 17 provinces in Turkey with 334 participants, in response to the question "Did you have a common and established teleworking practice before the Covid-19 Epidemic?" A percentage of 24.2% of the participating companies declared that they had already had a remote working practice before the pandemic (Deloitte,2020). When compared with Deloitte's research and considering the difference between the dates of the research and the ongoing transition to teleworking, the fact that the total number of participants who started teleworking before the pandemic (before 11.03.2020) was 32% (165) in our research and this provides a clue that the target group is represented well in this study.

The second phase research results of the present study revealed that the motivation and commitment levels and extrinsic motivation levels for teleworking intention after the pandemic changed significantly according to age groups but consecutively according to the Scheffe test results, among which groups the difference could not be explained. Similar empirical research was also applied in the United Arab Emirates, in which there was no significant difference among employees in their teleworking choice based on their age (Aboelmaged & Elamin, 2009).

The study's findings indicated that there were significant differences in motivation and commitment and intrinsic motivation levels for different education levels and participants at high school and associate degree education had significantly lower motivation and commitment and intrinsic motivation for the teleworking intention after the pandemic than their undergraduate and graduate and postgraduate and higher education level counterparts. This may be due to the differences in the digital competencies of employees at different educational levels. This finding regarding the education level of teleworkers is consistent with the study done in Saudi Arabia which is also quoted in the introduction part (Almubarak et al., 2022). However, in this study the difference was between the bachelor's degree and postgraduate degree. The bachelor's degree participants were more satisfied with teleworking than those with postgraduate degrees. This may be due to the fact that in the study conducted in Saudi Arabia, most of the participants having postgraduate degrees were from the education sector according to the statistics given and online education was never applied in Saudi Arabia before the pandemic. This may have reflected the less positive experience of teleworkers in education in the results. In this study of the participants with postgraduate degrees only 22%

were from the education sector.

Another finding in the study was the significant differences between the motivation and commitment levels and intrinsic motivation levels based on the teleworking experience of participants. In terms of motivation and commitment, participants with no teleworking experience and only 1 year of experience feel less motivation and commitment to teleworking intention after the pandemic than participants with more than 1 year of teleworking experience. Employees with no teleworking experience expressed significantly lower intrinsic motivation than the employees having 1 year or more of teleworking experience. This may be due to the fact that those people were in the process of adaptation to teleworking and the pandemic process imposed a stress on those participants so they may be less motivated. However, 1 year or more than 1 year experienced participants had the opportunity to adapt to teleworking before pandemic so their motivation and commitment may be higher. In the study applied in the United Arab Emirates, a cross tabulation analysis was conducted based on total experience to assess the difference among employees but the relationship between employees' teleworking choice and their years of experience was not significant (Aboelmaged & Elamin, 2009). In the future, researchers may test the importance of adaptation process on the teleworkers and when the teleworking experience increases how the motivation of both groups will change may be tested.

The results of the study demonstrated that participants whose company applied teleworking systematically had significantly higher motivation and commitment and intrinsic motivation for teleworking intention after the pandemic than the participants whose right to work remotely was compulsorily given part-time due to a social situation (Covid-19). In fact, this result can be considered to be an understandable result since the leaders and human resources management of the companies applying teleworking systematically had already adapted to teleworking on the side of the management, whereas on the other side in the companies of the teleworkers who had compulsorily passed to teleworking, the adaptation of leaders and human resources management might not also be accomplished yet. So, new research is also suggested to see the motivation level of these new teleworkers after "their management and system" and "as employees they" are also adapted to teleworking. For comparison and further explanation other similar studies were searched but no study has been found that only deals with the reasons of teleworking in the context of motivation and commitment and intrinsic motivation. Studies abroad focused more on employees' teleworking experiences based on marital status, teleworking mode, sector and hours of teleworking generally to report the case during the pandemic.

It was also observed in the analyses that the women's levels of extrinsic motivation were higher than the men's. This may be due to the traditional role of the woman in society. This result was also highlighted in Ozcan's (2017) qualitative research . They have to both work and deal with the house and children. This is in harmony with the results of the study done in the United Arab Emirates which showed that "females in the UAE tended to prefer full-time

teleworking" (Aboelmaged & Elamin, 2009) and also with the results of the study done in Saudi Arabia which indicated that "*positive views towards teleworking were more expressed by women than men*" (Almubarak et al., 2022:14).

The level of motivation and commitment and intrinsic motivation of teleworkers were significantly higher than the non-teleworkers. However, for this result there is a limitation. Since the research was done during the pandemic, while those who worked remotely during the pandemic felt safe because they could work in isolation in the pandemic environment, on the other hand, the non-teleworkers could not follow the distance rule very much and for this reason, the possibility of high anxiety levels of non-teleworkers is the limitation at this point. However, with the same limitation, a similar study was done in the province of Quebec, Canada and in this study, teleworking was also found to be associated with higher levels of well-being (Parent-Lamarche & Boulet, 2021). Differences between teleworkers and non-teleworkers were also studied in the Netherlands. In this study the majority of the non-teleworkers mentioned that they cannot telework, because they have to be physically present at their working place due to their positions and sector which is education. However, a comparison between teleworking application effects in Turkey and in the Netherlands is not appropriate since the sample of non-teleworkers in the Netherlands were the ones whose positions necessitated being physically in the workplace but the sample of non-teleworkers in Turkey also included the ones who had to be in the workplace since their companies did not apply teleworking. Yet in the Netherlands, following the adoption of the 2002 European teleworking framework agreement, since September 2003, when the framework agreement was put into practice with the approval of a workers' foundation, the ratio of teleworkers has seriously increased in the Netherlands year by year. The ratio of those who work remotely for at least a quarter of their working time to all employees was 12% in 2010 (Welz & Wolf, 2010). On the other hand, the mass transition to remote working in Turkey took place just after the pandemic in 2020. For this reason, comparison with the Netherlands and such countries was not done and also, in other such countries, since teleworking has been applied for many years, the research is also very detailed, and the levels are not compatible.

The results indicated the childless participants' motivation and commitment and intrinsic motivation level to be higher than the parent participants'. When starting the research, it was expected that there would be a difference in the motivation levels of participants with different marital statuses, but the result showed that in fact what made the difference was not marital status but having a child. The fact that 95.73% (n=493) of the participants in the 2nd phase research did not have long-term teleworking experience is likely to be reflected in the survey results. In Ozcan's 2017 study, the emphasis of a participant with 6.5 years of teleworking experience is worth being expressed in this regard.

''Spending too much time together tortured our marriage. You do not get the respect you deserve. The man who goes to work in a suit is different from the man at home in his pajamas and sitting at the computer. To be always at hand.'' (Ozcan, 2017).

Therefore, as the duration of teleworking increases, the evaluation of satisfaction according to marital status may be an important criterion in terms of ensuring employee belonging.

This finding about marital status in the second phase is consistent with the quoted study conducted in Romania. In this study similarly, "*respondents with children under 17 who worked only from home during the Covid-19 crisis reported a greater degree of work–life imbalance – both in comparison to those with children but working at the employer's premises or other locations and to those without children*." (Negruşa & Butoi, 2022:20). So especially the companies thinking of applying teleworking systematically after the pandemic, should consider their employees' motivation taking into consideration the main criterion of having a child.

As one of the first quantitative studies about teleworking conducted in Turkey during the pandemic, the study's findings have implications for policy, practice and research. According to the findings of the study, it should be underlined that it is important to evaluate teleworking situationally and a permanent transition to teleworking should be done after evaluating the criteria specified in the research results such as systematic readiness of the organization's management, adaptation of employees and parental status of employees.

Limitations of The Study and Suggestions for the Further Research

Since employees in Turkey have not been working remotely for a long time and most of the employees just experienced teleworking with the pandemic, the limit of the study may be that they may have evaluated mainly the advantageous aspects in the context of the factors such as the necessity to go to work and the reduction of traffic at first without fully experiencing the disadvantages in the long-term. So in the future, researchers can do similar studies to see how motivation is affected as teleworking experience increases in Turkey's working life. In this study, the main focus was on the current motivation and commitment levels of the teleworking intention after teleworking was first experienced. However, future new research can compare the pre-pandemic and post-pandemic motivation and commitment levels of teleworking intention.

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Istanbul Business Research

RESEARCH ARTICLE

Customer Mistreatment of Local Restaurants in the Context of Gastronomy Tourism

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Abstract

This study aims to determine the mediating role of surface acting and deep acting in the effect of emotional exhaustion through customer mistreatment cognitive rumination. The research universe consists of local restaurants within the scope of gastronomy tourism employees in Afyonkarahisar. A total of 396 surveys were gathered through simple random sampling methods from probability-based sampling methods between June 5th and November 20th 2022. The Smart PLS statistical program was utilized to test the hypotheses, and structural equation modelling was used to analyze the data. In this context, it has been found that rumination has a positive effect on emotional exhaustion and that mistreatment towards workers affects cognitive rumination and emotional exhaustion through surface acting and deep acting. However, deep acting does not play a mediating role. It has also been resolved that surface-acting and deep acting mediate the effect of customer mistreatment on emotional exhaustion. Based on the introspection's results, academic and sectoral recommendations have been materialized.

Graphical Abstract

Study 1: Conceptual/Theoretical Framework
- Customer Mistreatment (CM)
- Emotional Exhaustion (EE)
- Cognitive Rumination (R)
- Surface Acting (SA)

Study 2: Design/methodology/approach
- Data collected from local restaurants within the scope of gastronomy tourism in Afyonkarahisar Turkey
- Probability-based sampling methods
- Smart PLS statistical program
- Structural equation modeling

Study 3: Findings
- Determining the impact of CM on R.
- Determining the impact of CM on EE
- Determining the impact of R on EE
- It has been determined that SA and DA play a regulatory role in the effect of CM on EE.

Keywords

Customer Mistreatment, Cognitive Rumination, Emotional Exhaustion, Surface Acting, Deep Acting, Gastronomy

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Introduction

Social interaction between clients and service providers is essential for researchers in marketing and organizational behaviour (Bansal et al., 2004). Authors have tried to understand the effects of adverse treatment, such as poor treatment, condescending language, yelling/scolding, etc., on employees (Skarlicki et al., 2008). Adverse treatment of employees by customers is a critical topic regarding developments in customer relationships (Wang et al., 2011). Such treatment can cause physical and psychological problems for the employee. According to research, those who work in the service sector and have direct communication with customers are more likely to experience adverse treatment from customers, which can have negative consequences such as reduced motivation, decreased performance, and even burnout (Harris & Reynolds, 2003). Disrespect and demeaning, irrational, and aggressive behaviours towards employees can also lead to emotional exhaustion and, in turn, the harmful treatment of customers (Dormann & Zapf, 2004; Grandey et al., 2004; Rupp & Spencer, 2006). Inferior treatment medicine of workers by clients can cause employees to constantly think about these negative behaviours, leading to a loss of motivation and even hostile attitudes toward customers (Nishii et al., 2008).

Cognitive rumination, defined by the American Psychological Association as an obsession with repetitive thoughts that interfere with other forms of mental activity, can negatively impact employees. This can include a loss of motivation, disinterest in work, and a superficial attitude toward customers (Viswesvaran et al., 1998). Rumination can also negatively affect an individual's overall well-being and mental health. Individuals must be aware of and address rumination to maintain a healthy work environment and avoid negative consequences. The effects of negative attitudes and behaviours of customers towards employees can have different results for each employee. Bandura (2001) found that surface-action employees are more tolerant and patient with negative customer attitudes. Bandura and Locke (2003) stated that employees with deep action show more effort to control negative feelings, like anger and disappointment, in response to ill-treatment than those without self-efficacy.

One of the notable contributions of this study is its focus on the local restaurant industry in Turkey, which may provide insights into the experiences of service workers in a specific cultural and geographical context. The gap in the literature that this study addresses, is the lack of research on the mediating role of surface acting and deep acting in the relationship between customer mistreatment, cognitive rumination and emotional exhaustion in the service sector. While previous studies have examined the effects of mistreatment on employee well-being, this study provides a more nuanced understanding of the mechanisms underlying these effects. By identifying the specific roles of surface acting and deep acting in the relationship between mistreatment, rumination and emotional exhaustion, this study provides insights that can inform interventions to support employee well-being in the service sector. This study exa-

mined the bad situations experienced by local restaurant employees in Afyonkarahisar with customers. The effect of emotional exhaustion through cognitive rumination due to customer mistreatment was analyzed through the situational mediating role of surface acting and deep acting. Based on the analysis developments conducted through the survey forms collected in this direction, conclusions were drawn.

Conceptual/Theoretical Framework

Customer Mistreatment

Disrespectful, irrational, and aggressive customer behaviour toward employees can lead to emotional exhaustion and, in courtesy, lousy client behaviour (Zhan et al., 2016). This can prevent employees from showing professional, friendly, and patient treatment to customers (Koopmann et al., 2015). These relationships are essential factors that can damage customer relationships in businesses operating in the service sector (Zhu et al., 2004). Negative feelings like anger, stress and fear can be generated in employees who are subjected to bad behaviour by customers, which can also affect the quality of the service (MacIntyre & Vincze, 2017). To prevent these adverse outcomes, businesses need to establish and enforce clear policies and guidelines for how employees should handle disrespectful or aggressive customer behaviour (Huang et al., 2021). This could include training on de-escalation techniques and supporting employees who have experienced such behaviour (Richmond et al., 2012). Additionally, it is crucial for businesses to communicate with customers about acceptable behaviour and to take appropriate action when necessary (Skarlicki et al., 2008), such as refusing service or removing customers from the premises if necessary. By addressing and addressing inappropriate customer behaviour, businesses can create a more positive and professional environment for employees and customers (Boulstridge & Carrigan, 2000; Harris et al., 2005).

Emotional Exhaustion

Emotional exhaustion is a common phenomenon experienced by many employees (Karl & Peluchette, 2006), particularly those in high-stress jobs or working in environments with demanding workloads and tight deadlines (Shultz et al., 2010). It is characterized by feeling overwhelmed and drained, both physically and emotionally, and can lead to decreased productivity and overall job satisfaction (Kahn, 1993; Nanda & Browne, 1977). Emotional exhaustion often results from prolonged vulnerability to worry (Steinhardt et al., 2011). It can manifest in various ways, including cynicism and detachment, increased irritability and anger, and a lack of motivation and energy (Gaines & Jermier, 1983). It can also lead to physical symptoms such as headaches, insomnia, and weakened immune system function (Moon & Hur, 2011). Several factors can contribute to emotional exhaustion in the workpla-

ce, including high workloads and unrealistic expectations (Karl & Peluchette, 2006). When employees feel overwhelmed by excessive or unrealistic expectations from their supervisors or colleagues, it can lead to emotional exhaustion (Kim et al., 2020). Other factors contributing to emotional exhaustion include a shortage of authority over one's vocation, a need for more support from colleagues or management, and a lack of recognition for one's efforts. Organizations must address these issues to prevent burnout and maintain a healthy work environment for employees lacking control or autonomy (Fernet et al., 2012). Employees may feel they need more control over their work environment or decision-making processes, leading to frustration and frustration powerlessness (Charoensukmongkol, 2022). Ineffective communication and support, a lack of support or communication from supervisors or colleagues, can exacerbate feelings of isolation and increase stress (Mazer et al., 2014). Unclear job responsibilities, when employees are unsure of their responsibilities or how to prioritize tasks, can lead to confusion and a sense of being overwhelmed (Dewi & Ramantha, 2019).

Employees must prioritize self-communication and take breaks to prevent or alleviate emotional exhaustion (Søvold et al., 2021). Alliances must assemble supportive work surroundings, including providing resources and support for employees to manage stress and promote work-life consonance (Kossek et al., 2014). Supervisors and colleagues can also reduce emotional exhaustion by providing clear communication and expectations, offering support and guidance, and understanding team members' challenges (Cho et al., 2016; Kalliath & Kalliath, 2014). In conclusion, emotional exhaustion is a common and serious issue faced by many employees. By prioritizing self-care and creating a supportive work environment, individuals and organizations can work to prevent and alleviate this condition, leading to increased productivity and overall job satisfaction.

Cognitive Rumination

Rumination is repeating thoughts about past events that interfere with other mental activities and can negatively impact our cognitive soundness (Asim et al., 2021; Baranik et al., 2017). It can lead to feelings of avoidance or revenge toward the person displaying negative behaviour, which can damage relationships and decrease motivation (Miller & Roloff, 2014). Rumination has also been linked to adverse mental soundness consequences, such as the advanced threat of depression and difficulty in decision-making and problem-solving (Vandevala et al., 2017). In order to maintain healthy work environments and relationships with others, it is crucial to be aware of the tendency to ruminate and develop strategies to manage and reduce it (Nolen-Hoeksema et al., 2008).

Rumination prevents forgiveness and reconciliation, leading to attributing negative behaviour to other customers (Wang et al., 2018). Rumination can also lead to feelings of avoidance or revenge towards the person displaying negative behaviour (McCullough et al., 2007),

leading to the deterioration of relationships and loss of motivation. In the service industry, rumination can lead to emotional exhaustion behaviours and a surface attitude toward customers among employees (Baranik et al., 2017; Carson & Cupach, 2000; Lavelle et al., 2021). Rumination, an obsession with repetitive thoughts that interfere with other mental activities, can negatively impact an individual's well-being and operating performance. Staff in the service sector need to be aware of and address rumination to keep a positive attitude toward customers and avoid negative consequences (Strizhakova et al., 2012). In addition, rumination is associated with adverse mental health results, as if it increases the risk for depression and anxiety (Kelley et al., 2019). It can also lead to difficulty in decision-making and problem-solving (Berg et al., 2022). It is significant for individuals in the service sector to be aware of their tendency towards rumination (Tuerktorun et al., 2020) and to develop strategies for managing and reducing rumination to maintain productive and healthy work environments and customer relationships (Kemp et al., 2013).

Surface Acting and Deep Acting

Surface acting directs to the behaviour in which employees act as if they have feelings they do not possess, either through their body language or words (Grandey, 2003). Surface acting can be described as how an employee feels and behaves (Gabriel & Diefendorff, 2015). In service businesses, examples of surface acting by employees could include not showing genuine emotions while providing customer service, a fake smile, insincerity, lack of interest, etc. Surface acting not only lowers the quality of the service provided but can also lead to a loss of motivation and counter-productive work behaviour in employees over time. Surface acting can negatively affect employees and customers (Wang & Groth, 2014). For employees, it can lead to burnout and dissatisfaction with their work, as they may feel pressured to put on a facade and hide their genuine emotions (Hu & Shi, 2015). This can result in lower job satisfaction and decreased productivity (Hur et al., 2015). For customers, external theatre can lead to a need for more trust and authenticity in the service they receive, which can ultimately impact on their overall satisfaction with the company (Humphrey et al., 2015). Organizations need to recognize and address surface acting to foster a healthy and positive work environment for their employees and provide the best possible service to their customers (Huyghebaert et al., 2018).

Deep acting is emotional work that tries to change thoughts and feelings to show appropriate feelings for a situation (Zapf, 2002). This can be done through perspective taking, which involves taking the perspective of others and trying to understand their thoughts, feelings, and motivations (Lee et a., 2020). It can also be done by refocusing attention positively and redirecting attention away from negative emotions and towards more positive or neutral thoughts (Torrence & Connelly, 2019; Fisher, 2019). It is often seen as a more authentic and sustainable way to manage emotions than surface acting. It involves simply putting on a facade of emo-

tions without trying to change one's feelings (Totterdell & Holman, 2003). Evidence suggests that deep acting can have several benefits, including improved job performance, increased customer satisfaction, and greater personal well-being (Humphrey et al., 2015). However, it can also be demanding and require additional time and effort, as it involves actively trying to change one's thoughts and feelings (Zapf, 2002). Deep acting involves intentionally and authentically adjusting one's emotions to align with the emotional demands of a particular role or situation (Grandey, 2003). This technique can be helpful for individuals who engage in emotional labour or the effort to communicate particular sentiments as a domain of their employment, as it allows them to regulate their emotions sustainably (Näring et al., 2006).

Hypotheses Development

Customer Mistreatment and Cognitive Rumination Relationship

Research studies have shown that customer mistreatment can adversely affect employees' well-being and employment arrangement through cognitive rumination. Goussinsky (2020) found that mistreatment by customers affected rumination in nurses. Similarly, Baranik et al. (2014) and Baranik et al. (2017) located that cognitive rumination negotiated between client mistreatment and various outcomes for consumer service representatives. Wang et al. (2013) found that rumination about negative customer interactions can lead to negative emotional reactions in in-service employees. Ahmed et al. (2021) uncovered that rumination among retail sales employees indirectly affected counter-productive work behaviour in response to client mistreatment. Organizations should address customer mistreatment and create a positive work environment to prevent these adverse effects on employees. Established on these statements, the subsequent hypothesis can be formulated:

H_1: *Customer mistreatment has a significant positive effect on cognitive rumination.*

Customer Mistreatment and Emotional Exhaustion Relationship

When service employees experience customer mistreatment, it can leave them feeling emotionally drained and overwhelmed. This emotional exhaustion can lead to reduced motivation, poor performance and even burnout. In addition, mistreatment can lead to cognitive rumination, where employees constantly think about negative customer interactions, further exacerbating emotional exhaustion. Hu et al. (2018) found that teams that provided more employee participation opportunities had a less negative relationship with customer mistreatment and emotional exhaustion. Diefendorff et al. (2019) and Greenbaum et al. (2014) saw that client mistreatment significantly affects emotional exhaustion. Van Jaarsveld et al. (2010) found that workplace rudeness is interconnected with customer mistreatment and can lead to emotional exhaustion through job demands.

H_2*: Customer mistreatment has a significant positive effect on emotional exhaustion.*

Cognitive Rumination and Emotional Exhaustion Relationship

Several contemplations include studying the connection between cognitive rumination and emotional exhaustion, with findings supporting a positive correlation. Karing and Beelmann (2018) found that rumination significantly impacted emotional exhaustion. Luo and Bao (2013) found that employees' rumination in a call centre in China positively impacted on emotional exhaustion and service sabotage behaviour. Soenen et al. (2019) found that rumination about vocation moderated the affinity between prevailing righteousness and emotional exhaustion. Wang et al. (2022) found that hindrance stressors positively affected emotional exhaustion, mediated by affective rumination. These reflections indicate that cognitive rumination can result in emotional exhaustion, and organizations should support employees in managing their emotions and reducing rumination.

H_3*: Customer rumination has a significant positive effect on emotional exhaustion.*

Surface Acting and Deep Acting Moderator Effect

The use of deep-acting and surface-acting as emotional regulation strategies can contain a moderating impact on the connection between consumer mistreatment and emotional exhaustion, according to Baranik et al. (2014). Deep acting directs to actively change one's internal sensations to reach the emotional demands of a situation, while surface acting involves using simple strategies to manage emotions in social interactions. Studies such as those by Hari and Chao (2019) control encountered that deep acting corresponds to lower levels of emotional exhaustion, while surface acting is affiliated with higher levels. However, excessive or inauthentic use of these strategies may lead to emotional exhaustion or disconnection from one's emotions. Therefore, associations should live cognizant of the possible consequences and support workers in supervising their feelings regarding customer mistreatment.

H_4*: Surface acting will weaken the relationship between customer mistreatment and rumination. This weakening effect will be stronger for employees with higher levels of surface acting than those with lower levels of surface acting.*

H_5*: Surface acting will weaken the relationship between customer mistreatment and emotional exhaustion. This weakening effect will be stronger for employees with higher levels of surface acting than those with lower levels of surface acting.*

H_6*: Deep acting will weaken the relationship between customer mistreatment and emotional exhaustion. This weakening effect will be stronger for employees with higher levels of deep acting than those with lower levels of deep acting.*

H_7: Deep acting will weaken the relationship between customer mistreatment and rumination. This weakening effect will be stronger for employees with higher levels of deep acting than those with lower levels of deep acting.
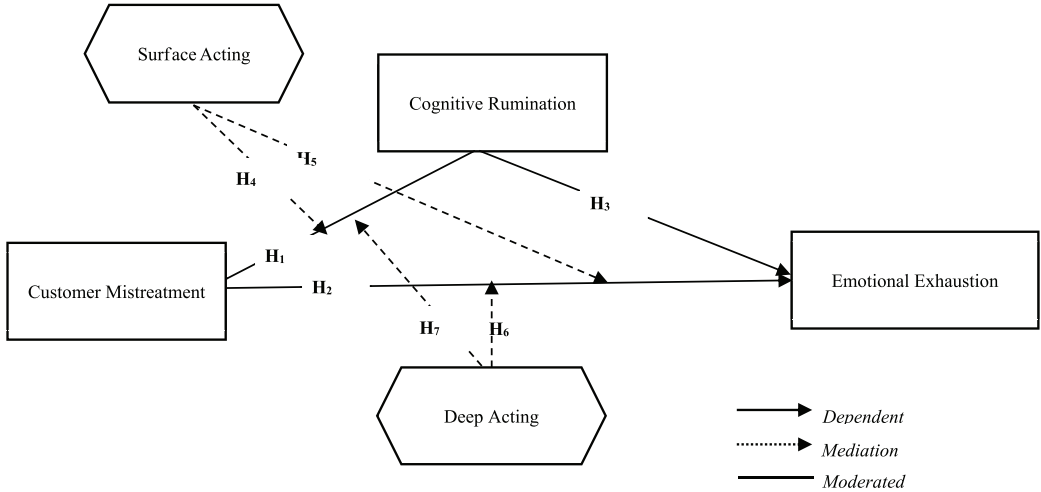
Figure 1. *Research Model Proposal*

Methodology

Study Site: Afyonkarahisar Local Restaurants

Afyonkarahisar is located in a prosperous location in terms of cultural and local food attractions. Different nations established many states in Anatolia, and various civilizations' historical and cultural remains are in Afyonkarahisar. In addition, the culinary culture constitutes the cultural tourism attraction of the province (Özdemir & Kervankıran, 2012: 136). There are restaurants in the province where very delicious products are produced. To this destiny, a survey questionnaire was distributed to local restaurant employees in Afyonkarahisar, using existing scales for the relevant variables.

Research Instrument

The survey questionnaire consists of two coalitions. The first coalition retains categorical inquiries to describe the participants' demographic characteristics. The second section includes statements about customer mistreatment, rumination, emotional exhaustion, surface acting, and deep acting. All objects in the two coalitions were calculated according to a five-point Likert scale ("strongly disagree" to "strongly agree"). In the analysis, the measurement

elements for customer mistreatment were obtained from a scale consisting of 18 statements by Wang et al. (2011), the measurement elements for rumination were obtained from a scale consisting of 6 statements by McCullough et al. (2007), the measurement elements for emotional exhaustion were obtained from a scale consisting of 5 statements by Wharton (1993), and the measurement elements for surface acting and deep acting were obtained from a ranking consisting of 8 statements by Brotheridge et al. (2003).

Sampling and Data Collection

This investigation aspires to define the mediating position of rumination in the effect of customer mistreatment on emotional exhaustion through surface acting and deep acting. The sampling technique was utilized in this study because it is challenging to contact the universe in terms of process, term, place, and cost. The simple random sampling method was chosen from the probability-based sampling methods. The G*POWER 3.1 was employed to determine the sample size (Faul et al., 2007; Ringle et al., 2015). As a consequence of the analysis, it was determined that the smallest sample size should be 98 (Power = 0.80, $f2 = 0.15$, $\alpha = 0.05$). A sum of 420 surveys was distributed to parties between June 5th and November 20th, 2022, with 396 surveys deemed suitable for analysis. The aim of the study is not to generalize the universe but to examine the average conditions in order to obtain information on the subject (Yıldırım & Şimşek, 2005). The participants were provided information about the research objectives to guarantee that their responses to the survey were accurate.

Data Analysis

The current study employed a robust statistical method, PLS-SEM, the SmartPLS software to analyze the collected data. The PLS-SEM method was implemented in two stages, and firstly, the measurement model was utilized to assess the dependability and reality of the scales employed in the analysis. Secondly, the structural model examined the analysis variables' associations. The analysis included the examination of demographic characteristics, as well as the assessment of various statistical indicators such as reliability, validity, and goodness of fit. Additionally, effect size, discrimination validity, and cross-loading values were considered to deliver a thorough knowledge of the underlying associations between the study variables. These findings were presented in tabular format to aid in interpreting and understanding the results.

Confirmatory Tetrad Analysis (CTA) results are calculated with Confidence Interval (CI) Low and CI Up values for the tetrad values of the indicators. Suppose a "0" exists between the CI Low and CI Up values. In that case, it is understood that the variables show a reflective property. If there is no "0" between them, they show a (±) formative property. In any indicator

group, if there is a "0" between the CI Low and CI Up values, it is sufficient for that scale to be expressed reflectively (Hair et al., 2017: 45). In the CTA performed, it was determined that the CI Low and CI Up values of all variables are "0"; thus, it was concluded that the measurement model variables show reflective properties. The validity and reliability analysis of the variables used in the study was conducted in a way suitable for the reflective structure. The consistent PLS-SEM method was used as the analysis method in the Smart (PLS-SEM) statistical program (see Figure 1).

Table 1
Confirmatory Tetrad Analysis Result

Indicator	t-statistics	p-value	CI Low adj.	CI Up adj.	R/F
1: EE1,EE2,EE3,EE4	2.086	0.037	-0.054	0.558	Reflective
2: EE1,EE2,EE4,EE3	0.552	0.581	-0.260	0.405	
1: DA1,DA2,DA3,DA4	1.456	0.146	-0.119	0.498	Reflective
2: DA1,DA2,DA4,DA3	2.264	0.024	-0.004	0.521	
1: CM10,CM11,CM12,CM13	2.531	0.012	-0.059	0.359	Reflective
2: CM10,CM11,CM13,CM12	3.291	0.001	-0.831	0.031	
1: R1,R2,R3,R4	1.590	0.112	-0.099	0.355	Reflective
2: R1,R2,R4,R3	1.577	0.115	-0.427	0.111	
1: SA1,SA2,SA3,CM1	0.962	0.337	-0.307	0.128	Reflective
2: SA1,SA2,CM1,SA3	0.444	0.658	-0.249	0.168	

DA= Deep Acting, CM= Customer Mistreatment, R= Cognitive Rumination, SA= Surface Acting, EE= Emotional Exhaustion

In the literature (Anwar et al., 2022; Schaarschmidt et al., 2015) of social sciences, surveys used from a single source can potentially create a threat of bias. Therefore, whether the Common Method Bias threatens the interpretation of research results was evaluated. All items were subjected to a principal component factor analysis, and Harman's single factor test was applied (Fuller et al., 2016). It was determined that all items do not explain the 50% variance threshold with a single factor (39.1%) and that the research has no common method bias. The results also confirmed no high correlation between the variables and proved no common method bias, as Bagozzi et al. (1991) suggested.

To determine structures with outer VIF weights equivalent to or more generous than 5, the equality of regression test was carried out as presented by Kock and Lynn (2012) and Hair et al. (2021). According to the relevant results, it was determined that there are no problems of equality of regression in the outer VIF value of all structures and that the values are less than 5 (Hair et al., 2022).

Results

Demographic Findings

Of the participants, 56.6% were female, and 43.4% were male. When the age range of the participants was examined, it was seen that the highest participation was from the age

range of 36-45 years (33.3%), followed by the age range of 26-35 years (23.5%). When the participants' education levels were examined, 47.2% had a bachelor's degree, and 2% had a doctorate. When the income status of the participants was examined, 36.9% had a medium income. In comparison, 6.1% had a very low income (see Table 2).

Table 2
Demographic Findings

Variables	Category	n	%
Gender	Female	224	56.6
	Male	172	43.4
Marital Status	Married	223	56.3
	Single	173	43.7
Age	Ages between 18-25	59	14.9
	Ages between 26-35	93	23.5
	Ages between 36-45	132	33.3
	Ages between 46-55	79	19.9
	Ages between 56-60	28	7.1
	Ages 61 and older	5	1.3
Level of education	Primary Education	15	3.8
	Middle School	25	6.3
	High School	123	31.1
	University	187	47.2
	Master's Degree	38	9.6
	PhD	8	2.0
Perception of Income	Very low	24	6.1
	Low	43	10.9
	Middle	146	36.9
	High	127	32.1
	Very High	56	14.1

Measurement Model Analysis

The scale's reliability was examined employing Cronbach's Alpha and rho_A values. The values lived seen to be in the range of 0.940-0.985, indicating that scales with a value greater than 0.70 have good reliability. Accordingly, it can be said that the reliability of the research is sufficient. (Dijkstra & Henseler, 2015), and rho_A reliability coefficient was found in the range of 0.948-0.987 (Hair et al., 2017). It was concluded that the Cronbach Alpha reliability coefficient is above 0.70 for each scale, and the rho_A reliability values are above 0.70 and good. The indicator loadings were examined for indicator reliability, and it was determined that all scale item loadings were overhead 0.50. According to Fornell and Larcker (1981), if indicator loadings are above 0.50, the scale's convergent validity can be considered acceptable even if more than 50% of the integrated reliability values are due to an error. However, the Average Variance Extracted (AVE) and the integrated reliability (rho_C) values were also examined for scale fit. The AVE value was found to be in the range of 0.779-0.952, with a value of 0.50 or above required (Fornell & Larcker, 1981), and the rho_C value was found to

be in the range of 0.942-0.984, with a value of 0.60 or above required (Bagozzi & Yi, 1988) (see Table 3).

Table 3
Validity and reliability analysis results

Variables and Indicators	λ	X̄	S.d	a	rho_A	rho_C	AVE
Customer Mistreatment (CM)*							
Our customers...							
Demand special attention.	0.950	3.220	1.458				
They are more critical than others.	0.944	3.264	1.473				
They want us to do things that they could do on their own.	0.745	2.756	1.144				
Vent their anger on us when their psychology is terrible.	0.948	3.225	1.476				
Please do not consider that we do our job within the rules of the business.	0.926	3.210	1.580				
Complain about us without any reason.	0.721	2.731	1.158				
Make excessive demands.	0.887	3.187	1.420				
Act impatiently.	0.943	3.223	1.499				
Yell at us.	0.749	2.720	1.113	0.985	0.987	0.984	0.779
Please speak to us aggressively.	0.963	3.140	1.515				
Get angry with us over minor issues.	0.933	3.259	1.500				
Argue with us constantly during the service.	0.757	2.697	1.158				
Refuse to listen to us in potentially harmful situations.	0.963	3.176	1.491				
Interrupt us while answering their questions.	0.925	3.256	1.511				
Make requests that we cannot fulfil.	0.755	2.777	1.118				
Make requests that are unrelated to the service offered.	0.979	3.184	1.461				
We need to improve our ability.	0.952	3.282	1.512				
Use condescending language during the service.	0.755	2.764	1.115				

Cognitive Rumination (R)*							
After our customer's mistreatment...							
I cannot stop thinking about what they did to me.	0.977	3.145	1.499				
Even when dealing with other things, I think about how these customers hurt me.	0.934	3.124	1.465				
I cannot stop thinking about the damage they caused me.	0.775	2.736	1.246	0.966	0.972	0.966	0.826
I am increasingly overwhelmed by negative feelings about what they did to me.	0.989	3.225	1.453				
Thoughts and emotions about how they hurt me continue to linger in my mind.	0.975	3.067	1.461				
The behaviour they displayed keeps coming to my mind.	0.775	2.723	1.191				
Emotional Exhaustion (EE)*							
After our customer's mistreatment...							
I sense emotionally exhausted from my employment.	0.888	3.231	1.461				
I suppose exhaustion when I wake up and encounter another day at an appointment.	0.930	3.145	1.617				
Performing with individuals all day is a responsibility for me.	0.708	2.754	1.223	0.940	0.948	0.942	0.766
I sense fatigued from my employment.	0.901	3.127	1.521				
I sense uneasy with my employment.	0.930	3.251	1.533				
Deep Acting (DA)*							
In my dealings with customers...							
I encounter the feelings I must offer clients.	0.961	2.902	1.600				
I handle the feelings I have to conduct toward others.	0.931	2.860	1.581				
I perform challenging to handle the feelings I require to offer clients.	0.969	2.891	1.649	0.978	0.979	0.978	0.919
I create the feeling that I need to offer clients.	0.972	2.961	1.678				
Surface Acting (SA)*							
In my dealings with customers...							
I hesitate to express my true feelings.	0.940	2.850	1.653				
I act as if I have emotions that I do not have.	0.994	2.881	1.701	0.983	0.984	0.983	0.952
I conceal my real emotions about a problem.	0.991	2.821	1.659				

*5-point Likert scale format was used. (1 = strongly disagree, 3 = undecided, 5 = strongly agree,

X̄=Mean, S.d=Standard Deviation, λ=Factor Loads, α=Cronbach Alpha, rho_C=Integral Reliability, AVE= Average Variance Extracted

The Fornell Larcker criterion (√AVE) was calculated to determine the discriminant validity of the scales. Upon examining the correlation loadings between variables, it was found that all variables had √AVE values lower than the first stage of discriminant validity (Fornell & Larcker, 1981) (see Table 4).

Table 4
Fornell Larcker Criterion and HTMT Ratio Result

Variables	√AVE					HTMT				
	DA	CM	R	SA	EE	DA	CM	R	SA	EE
DA	**0.958**					-				
CM	-0.728	**0.883**				0.722	-			
R	-0.565	0.537	**0.909**			0.562	0.527	-		
SA	0.182	-0.151	-0.202	**0.976**		0.182	0.145	0.200	-	
EE	-0.808	0.845	0.722	-0.172	**0.875**	0.806	0.842	0.721	0.167	-

DA= Deep Acting, CM= Customer Mistreatment, R= Cognitive Rumination, SA= Surface Acting, EE= Emotional Exhaustion
Note: Values in bold are the square root results of the average variance extracted (√AVE)

The Heterotrait Monotrait Ratio (HTMT) values' second stage of discriminant validity was also examined. HTMT coefficients encompass the average correlations of all statements related to the same variables and the geometric means of correlations of statements related to identical variables (Henseler et al., 2015). Upon examining the HTMT results, it was found that all values were below 0.85, indicating that the average correlation values of the variables are below 0.85, thus demonstrating discriminant validity (Voorhees et al., 2016) (see Table 4).

Table 5
Results of Cross-Loading Values

Indicators	EE	DA	CM	R	SA
EE1	**0.888**	-0.668	0.746	0.690	-0.202
EE2	**0.930**	-0.788	0.760	0.652	-0.202
EE3	**0.708**	-0.564	0.627	0.513	-0.012
EE4	**0.901**	-0.704	0.766	0.670	-0.156
EE5	**0.930**	-0.790	0.788	0.626	-0.155
DA1	-0.782	**0.961**	-0.700	-0.535	0.191
DA2	-0.757	**0.931**	-0.665	-0.520	0.170
DA3	-0.785	**0.969**	-0.726	-0.543	0.151
DA4	-0.772	**0.972**	-0.698	-0.568	0.186
CM1	0.797	-0.638	**0.950**	0.520	-0.159
CM2	0.794	-0.753	**0.944**	0.513	-0.149
CM3	0.652	-0.551	**0.745**	0.365	-0.085
CM4	0.785	-0.627	**0.948**	0.533	-0.158
CM5	0.783	-0.746	**0.926**	0.497	-0.186
CM6	0.641	-0.549	**0.721**	0.338	-0.063
CM7	0.733	-0.567	**0.887**	0.502	-0.197
CM8	0.799	-0.743	**0.943**	0.502	-0.136
CM9	0.661	-0.555	**0.749**	0.359	-0.041
CM10	0.807	-0.643	**0.963**	0.527	-0.179
CM11	0.782	-0.750	**0.933**	0.509	-0.148
CM12	0.649	-0.542	**0.757**	0.391	-0.088
CM13	0.781	-0.639	**0.963**	0.568	-0.181
CM14	0.791	-0.744	**0.925**	0.483	-0.152
CM15	0.655	-0.533	**0.755**	0.379	-0.029
CM16	0.802	-0.640	**0.979**	0.564	-0.155

Table 5
Results of Cross-Loading Values

Indicators	EE	DA	CM	R	SA
CM17	0.808	-0.753	**0.952**	0.506	-0.163
CM18	0.651	-0.524	**0.755**	0.385	-0.047
R1	0.704	-0.541	0.526	**0.977**	-0.234
R2	0.666	-0.536	0.502	**0.934**	-0.195
R3	0.567	-0.441	0.405	**0.775**	-0.155
R4	0.719	-0.551	0.535	**0.989**	-0.198
R5	0.683	-0.564	0.543	**0.975**	-0.182
R6	0.588	-0.433	0.397	**0.775**	-0.127
SA1	-0.168	0.176	-0.147	-0.185	**0.940**
SA2	-0.164	0.175	-0.142	-0.207	**0.994**
SA3	-0.173	0.183	-0.151	-0.199	**0.991**

DA= Deep Acting, CM= Customer Mistreatment, R= Cognitive Rumination, SA= Surface Acting, EE= Emotional Exhaustion

The study examined the cross-loading values and measurement elements of each structure. It is expected that the correlation loadings between the statements of each scale will be higher than the other correlation loadings for discriminant validity. A cross-loading value more significant than 0.70 is expected (Hair et al., 2019; Ghozali & Latan, 2015) (see Table 5). The cross-loading values in the research were found to be more significant than 0.70, and discriminant validity was ensured.

Table 6
Fit Measures of The Research Model

	Saturated Model	**Critical Value**	**Reference**
SRMR	0.066	0.08	Hu & Bentler, 1999
d_ULS	2.922	0.05	Henseler et al., 2015
d_G	4.623	0,05	
X^2	8.277.527	-	Dijkstra & Henseler, 2015
NFI	0.678	0.80	Lohmöller, 1989
rms Theta	0.212	0,12	Henseler et al., 2009
GoF	0,726	0,36	Tenenhaus et al., 2005

The chi-square (X^2) value of the research model was 8.277.527. The standardized root means square residual (SRMR) value, which is an absolute measure of the average size of the differences between observed and expected correlations, was 0.066 ($\leq$0.08) (Hu & Bentler, 1999). The normed fit index (NFI) value was calculated as 0.678 ($\leq$0.80) (Byrne, 1994). The d_ULS and d_G were also determined as 2.922 and 4.623, respectively. They were observed to be higher than the original values of the complete fit criteria (Dijkstra & Henseler, 2015). The research model's fit goodness values, the rmsTheta criteria, are higher than 0.12 (0.212) (Henseler et al., 2009). The GoF value was also higher than 0.36 (0.726) (Tenenhaus et al., 2005). As a result, it has been determined that the fit goodness values of the research model are acceptable (see Table 6).

Structural Model Analysis

When the variance inflation factor (InnerVIF) values are examined during the structural equation modelling process of the research model, it is understood that the values are below 5, and there is no linearity problem (Henseler et al., 2009). The effect size coefficient, f^2, is used to evaluate the size of the effect between variables (Wong, 2013), and the expected value for this coefficient is $0.02 \leq f^2 \leq 0.35$ (Sarstedt et al., 2017). In this study, the f^2 value was between 0.003 and 0.505. The model's determination coefficient (R^2) shows how much an external structure can explain an internal structure. The R^2 value is expected to be between 0 and 1. Weights between 0.75 and 0.50 indicate a high to medium explanation rate, while weights between 0.25 and 0 show a low explanation rate (Sarstedt et al., 2017). The R^2 value for the model indicates that rumination is explained at a level of 3.8%. In comparison, productive counter behaviour is explained at 8.6%.

The PLS analysis method was utilized in the research, and blindfolding analysis was carried out to calculate (Q^2). The t-values were calculated by taking 5000 subsamples through resampling (bootstrapping) to evaluate the effectiveness of the PLSc path coefficients. The prediction power coefficients (Q^2) calculated for endogenous variables should be greater than zero (Hair et al., 2017). In this context, it was resolved that the research model could predict the "rumination and emotional exhaustion" variables (see Table 7).

Tablo 7
Structural Model Analysis Results

	InnerVIF		f^2		R^2	Q^2
	R	E	R	EE		
DA	2.338	2.505	0.071	0.292		
CM	2.435	2.585	0.062	0.505		
R		1.614		0.467	0.381	0.295
SA	1.055	1.074	0.018	0.003		
EE					0.860	0.646

DA= Deep Acting, CM= Customer Mistreatment, R= Cognitive Rumination, SA= Surface Acting, EE= Emotional Exhaustion,

To examine the average size of the error for endogenous variables and to reveal the differences between them, the absolute error value (MAE) (PLSPredict) was analyzed. According to the consequences of the PLSPredict analysis, when the MAE weights of the dependent variables, PLS-MAE and LV-MAE, are compared, the LV-MAE values should have a higher ratio than the PLS-MAE values, and the PLS and LV Q^2 predict values should be taller than 0 (Hair et al., 2017). In this analysis, when the PLS-MAE and LV-MAE values of the dependent variables were compared, it was found that the LV-MAE values had a higher ratio than the PLS-MAE values and that the PLS and LV Q^2 prediction values were higher than 0. Therefore, it was concluded that the prediction power of the relevant dependent variables was sufficient.

Tablo 8
Structural Equation Model Results

HYPOTHESIS		ß	X̄	S.D.	t	p	R
H1	CM -> R	0.305	0.320	0.103	2.972	0.003**	√
H2	CM -> EE	0.427	0.436	0.064	6.721	0.000***	√
H3	R -> EE	0.325	0.319	0.054	6.018	0.000***	√
H4	CM*SA -> R	0.098	0.097	0.049	1.995	0.047*	√
H5	CM*SA -> EE	-0.045	-0.042	0.023	1.959	0.05*	√
H6	CM*DA -> EE	0.091	0.084	0.046	1.976	0.049*	√
H7	CM*DA -> R	-0.117	-0.129	0.092	1.274	0.203	X

DA= Deep Acting, CM= Customer Mistreatment, R= Cognitive Rumination, SA= Surface Acting, EE= Emotional Exhaustion, *p>0,05*p>0,01**, p>0,001**** ß=Beta, X̄=Mean, S.S.= Standard Deviation, R=Result

According to the path analysis results, it was determined that affective customer mistreatment has a significant positive effect on cognitive rumination (ß=0.305, p<0.05) and emotional exhaustion (ß=0.427, p<0.05). Therefore, hypotheses H_1 and H_2 are supported. Cognitive rumination has a significant positive effect on emotional exhaustion (ß=0.325, p<0.05). Accordingly, hypothesis H_3 is supported (see Table 8). The research model results are shown in Figure 2.

Table 9
Structural Equation Model Indirect Effect Results

	ß	X̄	S.D.	t	p
CM -> R -> EE	0.099	0.101	0.034	2.880	0.004**
CM -> EE	0.099	0.101	0.034	2.880	0.004**

CM= Customer Mistreatment, R= Cognitive Rumination, EE= Emotional Exhaustion, *p>0,05*p>0,01**, p>0,001**** ß=Beta, X̄=Mean, S.S.= Standard Deviation, R=Result,

Baron and Kenny (1986) state that exogenous variables must significantly affect endogenous variables for a mediation effect. When a mediating variable is contained in the sample, it is vital to ensure that the endogenous variables have a significant effect on the mediating variables and that the mediating variables have a significant effect on the endogenous variables. When examining the values in Table 9, it was found that the cognitive rumination (ß= 0,099, p>0,05) shows a moderated effect on the customer mistreatment variable on emotional exhaustion.

Surface acting will weaken the relationship between customer mistreatment and rumination. This weakening effect will be stronger for employees with higher levels of surface acting than those with lower levels of surface acting (ß=0,098, p<0.05). Therefore, the H_4 hypothesis is supported. The graphic created through Smart PLS showing the significant moderating effect is displayed in Figure 2.
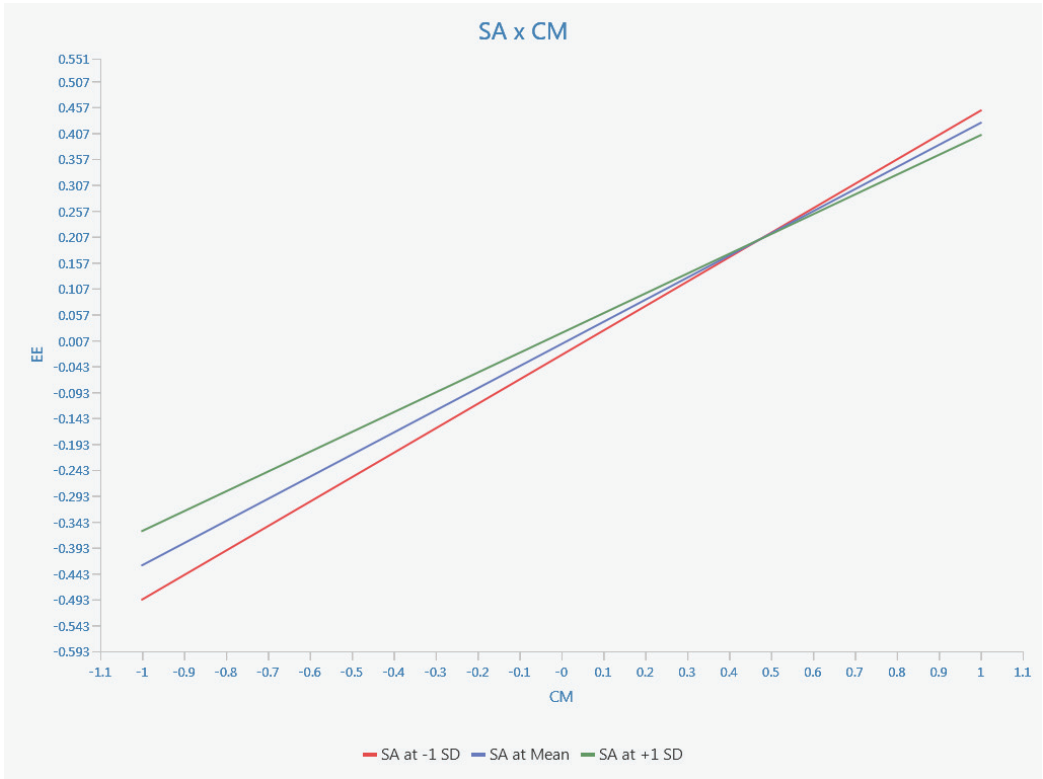
Figure 2. H_4 Slope Graph

Surface acting will weaken the relationship between customer mistreatment and emotional exhaustion. This weakening effect will be stronger for employees with higher levels of surface acting than those with lower levels of surface acting (ß=-0,056, p<0.05). Therefore, the H_5 hypothesis is supported. The graphic created through SmartPLS showing the significant moderating effect is displayed in Figure 3.

Figure 3. H$_5$ Slope Graph

Deep acting will weaken the relationship between customer mistreatment and emotional exhaustion. This weakening effect will be stronger for employees with higher levels of deep acting than those with lower levels of deep acting (ß=0.091, p<0.05). Therefore, hypothesis H$_6$ is supported. The graph showing the significant moderating effect created through Smart PLS is displayed in Figure 4.
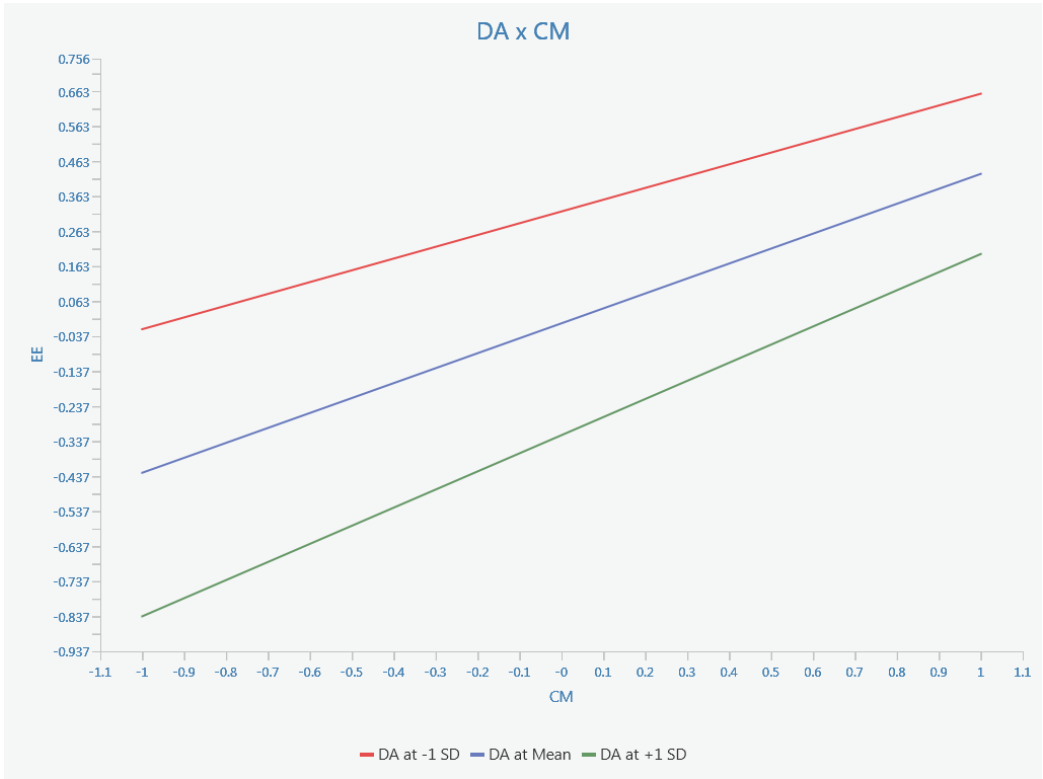
Figure 4. H_6 Slope Graph

Deep acting will weaken the relationship between customer mistreatment and rumination. This weakening effect will be stronger for employees with higher levels of deep acting than those with lower levels of deep acting (ß=-0.117, p>0.05). Consequently, hypothesis H_7 is not supported. The graph showing the insignificant moderating effect created through Smart PLS is displayed in Figure 5.
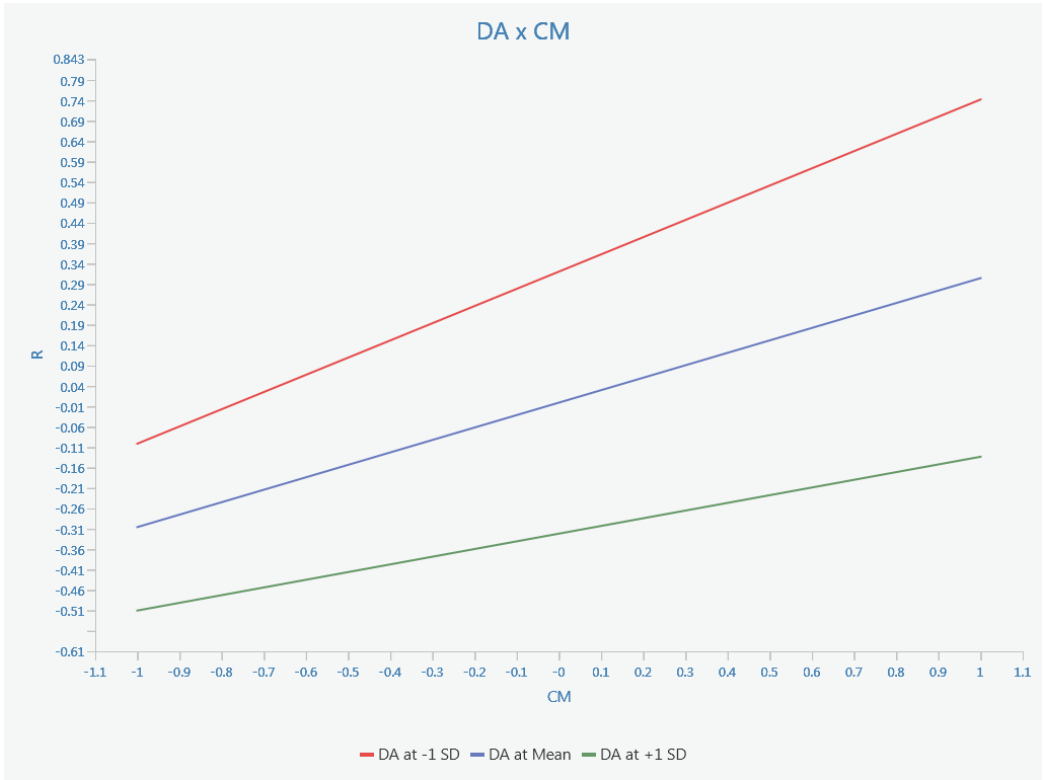
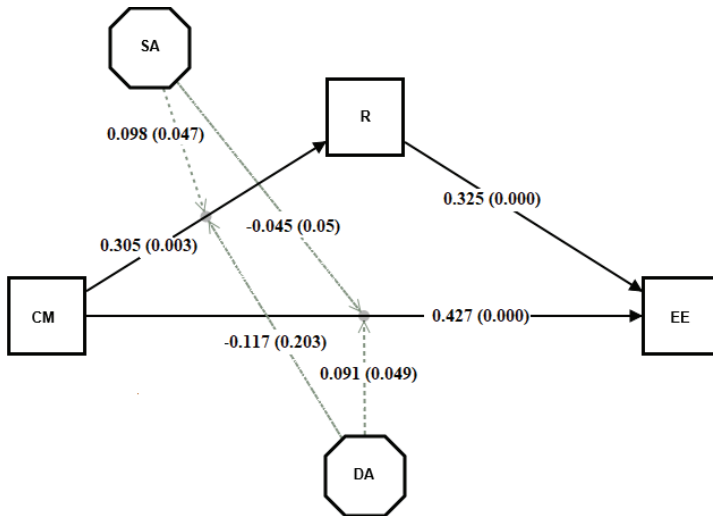*Figure 5.* H$_7$ Slope Graph

Figure 5. Research Model Results

Conclusion and Implications

Research shows customer mistreatment directly and positively affects cognitive rumination and emotional exhaustion. Specifically, when customers are mistreated, they tend to engage in rumination and experience emotional exhaustion. Furthermore, the results suggest that cognitive rumination has an immediate and significant positive effect on emotional exhaustion. Individuals who ruminate about a negative experience are also likely to experience emotional exhaustion. The results of the path analysis support hypotheses H1, H2 and H3, which state that affective customer mistreatment leads to cognitive rumination and emotional exhaustion and that cognitive rumination leads to emotional exhaustion. These findings are consistent with previous research (Ahmed et al., 2021; Baranik et al., 2014; Baranik et al., 2017; Diefendorff et al., 2019; Goussinsky, 2020; Greenbaum et al., 2014; Hu et al., 2018; Luo & Bao, 2013; Karing & Beelmann, 2018; Soenen et al., 2019; Van Jaarsveld et al., 2010; Wang et al., 2013; Wang et al., 2022).

Based on the information provided, the study suggests that surface and deep acting influence the relationship between customer mistreatment, rumination and emotional exhaustion among employees. The study also suggests that the relationship between customer mistreatment and rumination may be weaker for employees who engage in higher levels of surface acting than those who engage in lower levels of surface acting. Furthermore, the study suggests that the effect of customer mistreatment on emotional exhaustion via rumination may also be weaker for employees who engage in high levels of surface acting than for employees who engage in low levels of surface acting. In addition, the research suggests that deep acting weakens the indirect effect of emotional exhaustion on employees exposed to customer mistreatment and rumination. This effect may be more pronounced for employees with higher levels of deep acting than those with lower levels of deep acting. The research also suggests deep acting may weaken the relationship between customer mistreatment and employee rumination. This relationship is weaker for employees with higher levels of deep acting than those with lower levels of deep acting.

Theoretical and Practical Implications

The study has theoretical and practical implications for organizations in the service sector. The findings support the Job Demands-Resources model by showing that customer mistreatment can lead to burnout through rumination and emotional exhaustion. The study also contributes to emotion regulation theories by highlighting the moderating effects of surface acting and deep acting on negative outcomes of customer mistreatment. In addition, the study sheds light on the mediating role of rumination in the relationship between customer mistreatment and emotional exhaustion.

Organizations should implement training programmes to help staff deal with client abuse, including teaching adaptive strategies such as deep acting. To address the root causes of

mistreatment, organizations may need to implement policy changes, provide staff training and empower employees to respond to and report mistreatment. Workplace interventions such as mindfulness programmes and flexible schedules can help employees cope with the aftermath, such as rumination and exhaustion. Employee assistance programmes can provide counselling and mental health resources for those suffering from burnout or other issues related to customer abuse. Selection and screening procedures can also assess applicants' ability to regulate emotions and adapt to demanding customer-facing roles. Regular monitoring of employee well-being can help organizations identify problems before they become serious. Overall, the study highlights the need for organizations to take responsibility for the well-being of their employees by implementing preventative measures and providing resources for dealing with customer mistreatment.

Limitations and Recommendations for Future Research

It is suggested that future researchers conduct comparative studies between advanced and developing governments and consider using gender as a potential moderator variable to examine differences in rumination by gender. In addition, it may be advisable to include other moderators in the analysis in addition to deep acting and surface acting, which are currently included as moderators in the effect of Customer Mistreatment on Emotional exhaustion through rumination. For the industry, particularly for employees in service operations, it is suggested that managers organize various training to help employees cope with the stress caused by customer mistreatment and avoid loss of motivation. The studies (Baranik et al., 2014; Grandey, 2003; Green, 2009; Hari & Chao, 2019; Lan et al., 2022; Lavelle et al., 2019) were examined, and it was determined that their results were similar to the results of the relevant research.

Consider a more extensive sampling size; it can improve the study's statistical power and make it more likely to detect significant relationships between variables. Use a more diverse sample; a more diverse sample, including individuals from different age groups, education levels, and cultural backgrounds, could help to improve the generalizability of the conclusions to a broader area range of individuals. Incorporate multiple measures; using multiple measures of the same construct (e.g., self-report surveys and behavioural measures to assess rumination) can supply a better complete and robust performance of the construct. Consider other relevant variables; it may be helpful to consider other variables that could influence the relationship between customer mistreatment, rumination, emotional exhaustion, surface acting, and deep acting. For example, personal characteristics such as emotional intelligence or resilience could affect how individuals respond to customer mistreatment. Replicating the study in different contexts or with different samples can confirm the findings' robustness and generalizability. Importance for training; consider the practical implications of the analysis's findings for organizations and employees.

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Bu Telif Hakkı Anlaşması Formu tüm yazarlar tarafından imzalanmalıdır/onaylanmalıdır. Form farklı kurumlarda bulunan yazarlar tarafından ayrı kopyalar halinde doldurularak sunulabilir. Ancak, tüm imzaların orijinal veya kanıtlanabilir şekilde onaylı olması gerekir.

Responsible/Corresponding Author; *Sorumlu Yazar;*	Signature / *İmza*	Date / *Tarih*
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