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Research Articles

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From the Editor

This issue includes five articles on a wide range of topics such as growth economy, strategic intelligence analysis, consumer behavior, and social media studies.

The first article of the issue is by Ata ÖZKAYA and studies the effect of elasticity of substitution on output per capita, the steady-state capital-labor ratio and the steady-state output per capita. The study aims to contribute to the field by challenging the argument that there is a threshold of elasticity of substitution for which there is no steady-state equilibrium and for which ever-sustained growth is entailed. The study makes a unique contribution to the field by revising the arguments on the influence of elasticity of substitution on output per capita by drawing attention to different growth policies in developed and developing countries.

The second article is by Aman Al Habash and Murat Unanoğlu on the factors that influence pricing in the real estate sector in Turkey, which is also considered the determinant of economic productivity and growth in many nations. Authors draw attention to the importance of market analysis in making investment decisions in the real estate sector, which they argued to be an underappreciated issue, especially in Turkey. The study explores factors that influence residential real estate values with special emphasis on interest rates, inflation, gross domestic product, and population growth.

The third article is a theoretical discussion on how decisions should be made in strategic intelligence analysis and it is by Müberra HUDOĞLU and Gökhan AK. Authors argue that Chaos Theory but not the theories with a basis on deterministic things provides a better ground for making predictions in strategic intelligence analysis. To this end, they revisit the arguments of deterministic strategic thinking and Chaos Theory and try to show how chaotic thought process opens up a new understanding and reasoning capacity for the analyst.

The fourth article by Ahmet Waleed Arif ARIF is also about decision-making but in a different field, consumer behavior. Arif investigates how online reviews influence consumers' choice of restaurants and hotels. He finds out that the recentness of website reviews, characteristics of reviews or their usefulness had an impact on consumer choice.

The fifth article by Muhammad RAHEEL is also about processes of decision-making and how it is influenced by social media. Muhammad RAHEEL investigates how social media affects international students' recruitment process. The study finds out that social media usage plays a positive role in stimulating the intentions of international students in the selection of Universities and influencing the attitudes of international students toward the Universities.

The sixth article, which is written by Benebuin Ferdinand SANGU, is about the Role of Remittances in the Economic Development of Cameroon. The article examines how remittances, as a form of transfer of funds, affect the Cameroon economy. It concludes that remittances in Cameroon, allow for an increase in the level of the human capital of the members of the recipient households; ease the credit constraints of the households and promote higher human capital standards.

Finally, once again we are very grateful to our colleagues, the Rector of IAU, Prof. Dr. Yadigar İzmirli and to Associate Professor Dr. Mustafa Aydın, President of IAU, for their continued support for the FCPE.

Prof Dr. Celal Nazım İrem
Editör

The Elasticity of Substitution and Economic Growth Rate: What Linkage?

Ata Özkaya[1]

ABSTRACT

In this study, the effect of elasticity of substitution on output per capita, the steady-state capital-labor ratio, and the steady-state output per capita, are reconsidered respectively. The analysis is based on the constant elasticity of the substitution production function framework and the methodology used in this study is based on analytical proofs. Firstly, the squeeze theorem is employed for the elasticity of substitution and a general solution for the production function with initial and terminal conditions is derivated. The study then progressed to investigate the steady-state behavior of production function. In this vein, at steady-state the effect of elasticity of substitution on capital accumulation per labor and on output per capita, is investigated respectively. Firstly, output per capita is a decreasing function of the elasticity of substitution is demonstrated. Secondly, the result as at steady-state an increase in elasticity of substitution decreases the income per-capita and decreases the steady-state capital-intensity is demonstrated. Moreover, the finding as at steady-state an increase in elasticity of substitution strictly decreases capital share. This study challenges the studies reporting that there is a threshold of elasticity of substitution for which there is no steady-state equilibrium and for which ever-sustained growth is entailed. The findings in this study contribute to the literature by revising the influence of the elasticity of substitution on output per capita. The results of this study can explain the differences in growth paths for developed and developing countries and suggest a policy application that increasing the minimum marginal product of labor increases the growth rate of output per-capita in countries where the elasticity of substitution is higher-than-unity.

Keywords: *Economic Growth, Constant Elasticity of Substitution, Production Function, Dynamical Equilibrium, Steady-State Growth Rate.*

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INTRODUCTION

The constant elasticity of the substitution production function introduced in Solow (1956:77) exemplified a particular condition under which perpetual growth would be possible. This condition can be generalized as follows: the saving-investment obtained from the minimum marginal product of capital is greater than the growth rate of the labor force. This finding leads to an extensive analysis of the relationship between the elasticity of substitution and the growth rate of income and income per capita. In addition, the investigation of whether different growth rates among countries can be explained by the elasticity of substitution has taken a considerable place in the literature on growth theory. In growth models, technologies more flexible than Cobb-Douglas are needed for the consideration of varying factor shares, factor-biased technical change, and appropriate technology (Acemoglu, 2003, Caselli, 2005, Caselli & Coleman, 2006, Temple, 2012).

The aim of this paper is to analyze the effect of elasticity of substitution on income per capita, the growth rate of the capital-labor ratio, the growth rate of income per capita, the steady-state capital-labor ratio, and the steady-state income per capita, respectively.

The theoretical perspective examined in this study has already been investigated by various studies. De La Grandville (1989) showed that there is a threshold of elasticity of substitution for which there is no steady-state equilibrium, implying perpetually increasing capital-labor ratio and income per capita (Throughout the study, income per capita and output per capita are used interchangeably). Moreover, this threshold is increasing with the growth rate of labor and is decreasing with the saving rate. Another crucial finding reported by de La Grandville (1989) is that the growth rate of income per capita and the growth rate of capital per labor are increasing functions of the elasticity of substitution. In addition, de La Grandville (1989) analyzed the effect of elasticity of substitution conditional on steady-state and the author showed that steady-state income per capita is an increasing function of the elasticity of substitution. In a related study, the findings of Klump & de La Grandville (2000) depict that if two countries have common initial conditions, the one with the higher elasticity of substitution will always experience, other things being equal, a higher income per capita. Moreover, if any, the equilibrium values for capital per labor and income per capita are both increasing functions of the elasticity of substitution. In addition, the results in Klump & Preissler (2000) show that a higher elasticity of substitution leads to both a higher steady-state and an increase in the probability of permanent growth. Finally, de La Grandville & Solow (2006) report that the elasticity of substitution can increase the growth rate of the economy and its effect may be greater than the contribution of the increase in the savings rate and/or technical progress. More recently, de La Grandville (2009) states that income and income per capita are increasing functions of the elasticity of substitution.

On the other hand, the studies in the empirical literature report that cross-country regressions identify an elasticity of substitution greater than unity (Masanjala & Papageorgiou, 2004). *Among the recent studies, Mallick (2012) estimates the elasticity of substitution value for 90 countries* ranging from 0.03 to 2.18, where developing countries mostly enjoy elasticity of substitution levels higher than unity. More specifically, recent empirical studies show that the US economy historically has elasticity of substitution level lower-than-unity and continues to stay lower-than-unity. Furthermore, Oberfield & Raval (2014) estimate that over the period from 1972 to 2007 the elasticity of substitution is lower than one and has risen from 0.67 to 0.75. Cantore et al. (2017) and more recently Knoblach et al. (2020) report similar results. Similarly, a non-unitary elasticity also has implications for fiscal policy, as in the Backus et al. (2008) study of the cross-country relationship between capital-output ratios and corporate tax rates. More widely, theorists often consider the implications of variation in the elasticity of substitution, and it has been argued that the CES technology deserves much greater prominence in short-run macroeconomics. If the theoretical studies are aligned with empirical findings, one will query whether policy applications to enhance the rate of growth are sensitive to the elasticity of substitution's level with respect to unity.

This paper contributes to the related literature in various aspects. The present study examines whether the limiting values for the marginal product of input factors can be used as a policy instrument to increase the growth rate of income per capita. Second, for the elasticity of the substitution lower-than-unity policy instrument should be different from the case for higher-than-unity.

The rest of the study is organized as follows. The basis on a short theoretical review and preliminary setting in Section 2, the result as there is a threshold of elasticity of substitution for which there is no steady-state equilibrium and for which ever-sustained growth is entailed is proposed. The findings of this study are developed progressively in Sections 3,4 and 5. Particularly, Section 3 addresses whether substitution elasticity can be considered a perpetual "engine" of economic growth. The results of this section contribute to the debate from this perspective. Section 4 investigates the steady-state behavior of the production function. Section 5 proposes a policy recommendation to boost the rate of economic growth by making use of limiting marginal products. This can also be used to explain technological progress and economic development differences in countries.

PRELIMINARY ISSUES: PRODUCTION FUNCTION AND ELASTICITY OF SUBSTITUTION

The constant elasticity of the substitution production function has already been exemplified and modeled in various studies, Solow (1956), Pitchford (1960), and David & van de Klundert (1965). These studies assumed that coefficients of input factors are arbitrary free parameters. Arrow et al. (1961) contributed by proposing a mathematical derivation of CES function based on empirical observations on the relationship between wage rate and labor productivity. In their study, Arrow et al., conceptualized the free parameters as integration constants derivated from a second-order differential equation. Ozkaya (2021) showed that these integration constants are not arbitrarily free constants but are initial and terminal conditions for marginal productivity. The terms $F_K(K,0)\frac{\sigma-1}{\sigma}$ and $F_L(0,L)\frac{\sigma-1}{\sigma}$ correspond to the free parameters that have already been introduced in previous models in Solow (1956), Pitchford (1960), Arrow et al. (1961) and David & van de Klundert (1965).

The expressions (1) and (2) are based on the studies Barelli & Abreu Pessôa (2003) and Ozkaya (2021). The elasticity of substitution is denoted by. The inputs of the production function are capital services, *K,* and labor force, *L*. Whenever σ>1, the constant elasticity of the substitution production function is as shown in (1).

$$F(K,L)=\left((F_K(K,0).K)^{\frac{\sigma-1}{\sigma}}+(F_L(0,L).L)^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\sigma}{\sigma-1}}$$

(1)

For σ<1, the production function is as shown in (2).

$$F(K,L)=\left((F_K(K,\infty).K)^{\frac{\sigma-1}{\sigma}}+(F_L(\infty,L).L)^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\sigma}{\sigma-1}}$$

(2)

For σ>1, the coefficients F_K (K,0) and F_L (0,L) denote the initial condition of the production function and denote the minimum marginal product of capital and the minimum marginal product of labor, respectively. Each is constant with respect to its input.

On the other hand, for σ<1, the coefficients F_K (K,∞) and F_L (∞,L) are terminal conditions for the production function. F_K (K,∞) and F_L (∞,L) correspond to the maximum marginal product of capital and maximum marginal product of labor, respectively.

Dividing the production function (1) and (2) by labor force quantity gives output per capita (intensive form definition) production function. In the literature, by the homogeneity assumption of the production function, it is conveniently shown as , with as $f(k)$, with $k=\frac{K}{L}$.

By the definition of Solow (1956), the growth rate of capital per labor is written as follow: $\frac{\dot{k}}{k}=s\frac{f(k)}{k}-n$

In this setting, *f(k)* is the output per capita production function, the saving-investment ratio is denoted by *s*, and the increment of the labor force is shown by *n*.

Proposition 1.

There exists no threshold of elasticity of substitution for which there is no steady-state equilibrium and for which ever-sustained growth entails. Therefore, there exist no threshold value for saving-investment ratio, s and growth rate of labor, n as well.

Proof 1.

The expressions (A1) and (A2) in the Appendix depict the CES function formulation given by de La Grandville (1989).

The parameter $\beta^*(\sigma)\frac{\sigma}{\sigma-1}$ seemingly depends on . From (A3) and (A4), it is straightforward that $\beta^*(\sigma)^{\frac{\sigma}{\sigma-1}}$ is a constant with respect to both capital-labor ratio and elasticity of substitution: that is, $\frac{d\beta^*(\sigma)^{\frac{\sigma}{\sigma-1}}}{dk}=0$ and $\frac{d\beta^*(\sigma)^{\frac{\sigma}{\sigma-1}}}{d\sigma}=0$.

The same argument is also true for the other parameter denoted $\alpha^*(\sigma)^{\frac{\sigma}{\sigma-1}}$.

This finding stands strictly in contrast to the result of de La Grandville (1989) and de La Grandville and Solow (2009). De La Grandville (1989:479) claim that "*there is a threshold of for which there is no steady-state equilibrium. This would imply perpetually increasing capital-labor ratio and income per capita*."

De La Grandville (1989:479) claim that "*the elasticity of substitution, as a measure of the efficiency of the productive system, has to be higher when the population growth rate increases or when the savings-investment rate decreases*."

The result of this study challenges the argument of de La Grandville (1989). The reason is that the author did not derivate integration constants but propose an assumption. In the study de La Grandville (1989:479-481), it is erroneously assumed that $\beta^*(\sigma)^{\frac{\sigma}{\sigma-1}} = \frac{n}{s}$ and then σ is misidentified as a function of $\frac{n}{s}$ and β*(σ). Moreover, de La Grandville (1989) did not discriminate the case σ >1 from σ<1, in its analysis and arguments.

LABOR SHARE AND CAPITAL SHARE

The section 3 proposes the results on the relationship between elasticity of substitution, and first; labor share of income, second capital share of income, and third income per capita. For notational easiness, throughout the paper, in expression (1) let us denote $\beta = F_K(K,0)$ and $\alpha = F_L(0,L)$. Similarly, in (2), let us denote $b = F_K(K,\infty)$ and $a = F_L(\infty,L)$. Different from the parametrization in de La Grandville (1989), the parameters *β, α,b,a* used in this study are constants and do not depend on neither input factors nor elasticity of substitution. The parameter *β* and α are different from β* (σ), α* (σ), which are used in Proposition 1 of the present study.

Proposition 2.
For >1 , the effect of the elasticity of substitution on the share of capital depends on the ratio of minimum marginal products. On the other hand, for σ<1 the effect of the elasticity of substitution on the share of capital depends on the ratio of maximum marginal products.
For >1:
i.) if $\frac{F_L(0,L)}{F_K(K,0)} < k$ then $\frac{\partial \pi}{\partial \sigma} > 0$; ii.) if $\frac{F_L(0,L)}{F_K(K,0)} > k$ then $\frac{\partial \pi}{\partial \sigma} < 0$; iii.) if $F(0,L) = F(K,0)$ then $\frac{\partial \pi}{\partial \sigma} = 0$.
For < 1 :
i.) if $\frac{F_L(\infty,L)}{F_K(K,\infty)} < k$ then $\frac{\partial \pi}{\partial \sigma} > 0$; ii.) if $\frac{F_L(\infty,L)}{F_K(K,\infty)} > k$ then $\frac{\partial \pi}{\partial \sigma} < 0$; iii.) if $F(\infty,L) = F(K,\infty)$ then $\frac{\partial \pi}{\partial \sigma} = 0$.

Proof 2.
For σ>1 output per-capita is defined as $\frac{F(K,L)}{L} = f(k) = F_K(K,0)k(1+m)^{\frac{\sigma}{\sigma-1}}$ where $k = \frac{K}{L}$ and $m = \left(\frac{F_L(0,L)}{F_K(K,0)k}\right)^{\frac{\sigma-1}{\sigma}}$.

Let $\pi = \frac{kf'}{f} = \frac{1}{1+m}$ be capital share of output per capita. The partial de rivative leads to (3).

$$\frac{\partial \pi}{\partial \sigma} = \frac{-m.\ln m}{\sigma(\sigma-1)(1+m)^2}$$
(3)

For >1 , the following result is obtained

i.) If $\ln m < 0 \leftrightarrow \frac{F_L(0,L)}{F_K(K,0)} < k$ then $\frac{\partial \pi}{\partial \sigma} > 0$, equivalently if $\frac{1-\pi}{\pi} < 1$ then $\frac{\partial \pi}{\partial \sigma} > 0$ ii.) if $\ln m > 0 \leftrightarrow \frac{F_L(0,L)}{F_K(K,0)} > k$ then $\frac{\partial \pi}{\partial \sigma} < 0$; iii.) if $F_L(0,L).L = F_K(K,0).K$ then $\frac{\partial \pi}{\partial \sigma} = 0$.

For < 1, income per-capita is $f(k) = F_K(K,\infty)\ k(1+v)^{\frac{\sigma}{\sigma-1}}$ and v stands for $v = \left(\frac{F_L(\infty,L)}{F_K(K,\infty)k}\right)^{\frac{\sigma-1}{\sigma}}$. The following result is obtained.

i.) if $\ln v < 0 \leftrightarrow \frac{F_L(\infty,L)}{F_K(K,\infty)} > k$ then $\frac{\partial \pi}{\partial \sigma} < 0$; ii.) if $\ln v > 0 \leftrightarrow \frac{F_L(\infty,L)}{F_K(K,\infty)} < k$ then $\frac{\partial \pi}{\partial \sigma} > 0$; iii.) if $F_L(\infty,L).L = F_K(K,\infty).K$ then $\frac{\partial \pi}{\partial \sigma} = 0$.

Proposition 3.
For σ<1, an increase in the elasticity of substitution decreases the labor share of income under the condition that $\frac{F_L(\infty,L)}{F_K(K,\infty)} < k$.

Proof 3
Replacing m with v in (3) is sufficient to obtain the desired result. That is: if the ratio of the maximum marginal product of labor to the maximum marginal product of capital is greater than the capital-labor ratio, meaning that the labor share of income is lower than capital share of income, then an increase in elasticity of substitution decreases the labor share of income.

Proposition 4.
An increase in the elasticity of substitution decreases the income per capita.
Proof 4.
The logarithm of income per-capita is $\ln f(k) = \ln\beta k + \frac{\sigma}{\sigma-1}\ln(1+m)$. The derivative of both sides leads to (4). Since $\frac{m.\ln m}{1+m} < \ln(1+m)$, for all k, for all σ and $m > 0$, for all k for all σ and m > 0 equation (4) holds.

$$\frac{\partial f}{\partial \sigma} = \frac{f(k)}{(\sigma-1)^2}.\left(\frac{m.\ln m}{1+m} - \ln(1+m)\right) < 0$$
(4)

In order to investigate the effect of elasticity of substitution on the rate of growth for capital accumulation per labor, one has to differentiate both sides of the growth rate of capital per labor, $\dot{k}/k = s\, f(k)/k - n$
with respect to . The desired result is shown in (4).

$$\frac{\partial}{\partial \sigma}\left(\frac{\dot{k}}{k}\right) = \frac{s.\beta.(1+m)^{\frac{\sigma}{\sigma-1}}}{(\sigma-1)^2}.\, ln\left(\frac{m^{\frac{m}{1+m}}}{1+m}\right) \tag{4}$$

Equation (4) show that $\frac{\partial}{\partial \sigma}\left(\frac{\dot{k}}{k}\right) < 0$ for all , and for both cases σ<1 and σ<1. This result clearly indicates that the rate of growth for capital per labor decreases in the elasticity of substitution.

STEADY-STATE BEHAVIOR OF PRODUCTION FUNCTION

The section 4 analyzes the effect of the elasticity of substitution on certain variables under the condition where a steady state exists.

Proposition 5.

An increase in the elasticity of substitution decreases the steady-state income per capita.
Proof 5.
In expression (4) substituting the steady-state capital-labor ratio gives the desired result.
Proposition 6.
Increasing the elasticity of substitution strictly decreases the steady-state capital share.
Proof 6.
Let π^* denote the steady-state share of capital:

$$\pi^* = \left(\frac{f(k(\infty))}{\beta k(\infty)}\right)^{\frac{1-\sigma}{\sigma}} = \left(\frac{n}{s\beta}\right)^{\frac{1-\sigma}{\sigma}}, \text{ where the domain is } \quad 0 < \left(\frac{n}{s\beta}\right)^{\frac{1-\sigma}{\sigma}} < 1.$$

$$\frac{\partial \pi^*}{\partial \sigma} = \frac{-\pi^*}{\sigma^2} ln\frac{n}{s\beta} \tag{5}$$

Since the steady-state requires that $\frac{n}{s} > \beta$, the steady-state capital-share absolutely decreases with the elasticity of substitution $\frac{\partial \pi^*}{\partial \sigma} < 0$.
Proposition 7.
An increase in the elasticity of substitution decreases the steady-state capital-intensity. That is: $\frac{\partial k(\infty)}{\partial \sigma} < 0$ for all and for all .

Proof 7.

For $\sigma > 1$ the steady-state capital intensity is given by $k(\infty) = \frac{s\alpha}{n\left(1-\left(\frac{n}{s\beta}\right)^{\frac{1-\sigma}{\sigma}}\right)^{\frac{\sigma}{\sigma-1}}} = \frac{s\alpha}{n(1-\pi^*)^{\frac{\sigma}{\sigma-1}}}$.

Let $(1-\pi^*)^{\frac{\sigma}{\sigma-1}} = w$ .Taking logarithm of both sides and differentiating with respect to σ leads to $\frac{-1}{(\sigma-1)^2} ln(1-\pi^*) + \frac{\sigma}{\sigma-1}\frac{-d\pi^*}{d\sigma}\frac{1}{(1-\pi^*)} = \frac{1}{w}.\left(\frac{\partial w}{\partial \sigma}\right)$, we substitute (4), and we obtain $\frac{1}{w}.\left(\frac{\partial w}{\partial \sigma}\right) = \frac{-1}{(\sigma-1)^2} ln(1-\pi^*) + \frac{1}{(\sigma-1)}\frac{\pi^*}{\sigma} ln\frac{n}{s\beta}\frac{1}{(1-\pi^*)}$
Since $\frac{\partial k(\infty)}{\partial \sigma} = \frac{s\alpha}{n.w}\left(-\frac{1}{w}.\left(\frac{\partial w}{\partial \sigma}\right)\right)$, equation (6) holds.

$$\frac{\partial k(\infty)}{\partial \sigma} = \frac{s\alpha}{n}\frac{(1-\pi^*)^{\frac{\sigma}{1-\sigma}}}{(\sigma-1)}\left(\frac{1}{(\sigma-1)} ln(1-\pi^*) - \frac{\pi^*}{\sigma(1-\pi^*)} ln\frac{n}{s\beta}\right) < 0 \tag{6}$$

Recall that the steady-state requires the condition $\frac{n}{s} > \beta$, for $\sigma > 1$, for σ>1. Therefore, the sensitivity of steady-state capital-intensity to a change in elasticity of substitution is absolutely negative, namely $\frac{\partial k(\infty)}{\partial \sigma} < 0$. To compute $\frac{\partial k(\infty)}{\partial \sigma}$ for σ<1 , one has to rearrange the parameters in (5). Since the steady-state requires the condition n/s<b it is obvious that the sensitivity of steady-state capital-intensity to a change in elasticity of substitution is negative, namely $\frac{\partial k(\infty)}{\partial \sigma} < 0$. We also state that higher-than-unity elasticity of substitution does not necessarily lead to higher steady-state capital-labor ratio and/or higher per capita income.

The results of the present study are strictly in contrast to the studies in the literature, which report that the elasticity of substitution is an engine for the growth.

A POLICY RECOMMENDATION TO ENHANCE THE GROWTH RATE OF OUTPUT

This section proposes some policy implications showing how the output per capita can be perpetually increased.

Proposition 8.
For >1, increasing the minimum marginal product of labor increases the rate of growth of income per capita.

Proof 8.
The derivative of $(\dot{f}/f)$ with respect to α can be defined as:

$$\frac{\partial\left(\dot{f}/f\right)}{\partial \alpha} = \left(\frac{\partial}{\partial \alpha}\left(\frac{df}{dk}\frac{k}{f}\right)\right).\frac{\dot{k}}{k} + \left(\frac{\partial}{\partial \alpha}\left(\frac{\dot{k}}{k}\right)\right)\frac{df}{dk}\frac{k}{f}\ .$$

The derivative of growth rate of capital per labor ratio with respect to α equals $\frac{\partial\left(\dot{k}/_{k}\right)}{\partial\alpha} = \frac{s\beta}{\alpha} m(1+m)^{\frac{1}{\sigma-1}}$. And, the derivative of the capital share of income with respect to α equals $\frac{\partial}{\partial\alpha}\left(\frac{df}{dk}\frac{k}{f}\right) = \frac{-(\sigma-1)}{\sigma.\alpha}\frac{m}{(1+m)^2}$. Substituting $\frac{\partial\left(\dot{k}/_{k}\right)}{\partial\alpha}$ and $\frac{\partial}{\partial\alpha}\left(\frac{df}{dk}\frac{k}{f}\right)$ gives the derivative of $\left(\frac{\dot{f}}{f}\right)$ with respect to α. That is:

$\frac{\partial\left(\dot{f}/_{f}\right)}{\partial\alpha} = \frac{s\beta}{\alpha}\frac{m}{(1+m)}\left(\frac{(1+m)^{\frac{1}{\sigma-1}}}{\sigma}\right) + \frac{(\sigma-1)}{\sigma.\alpha}\frac{m.n}{(1+m)^2}$. Rearranging above formulation leads to the following result: $\frac{\partial\left(\dot{f}/_{f}\right)}{\partial\alpha} = \frac{m}{\alpha.\sigma(1+m)^2}\left(\frac{sf}{k} + (\sigma-1)n\right) > 0$ where $\frac{sf}{k} + (\sigma-1)n > 0$ for all k.

We already know that: $\frac{sf}{k} + (\sigma-1)n > 0$ holds for all k. Therefore, an increase in minimum marginal product of labor strictly increases the growth rate of income per capita. In order to perpetually increase the rate of growth of output, the policy makers should enhance the minimum marginal product of labor with respect to that of capital.

CONCLUSION AND DISCUSSION

This study contributes to the literature on the properties of constant elasticity of substitution production function (Solow, 1956, Pitchford, 1960, Arrow et al., 1961, David & van de Klundert, 1965, Barro & Sala-i-Martin, 1995). More specifically, this study revises the aforementioned findings in the literature (de La Grandville, 1989, Klump & Preissler, 2000), and corrects some inconsistencies and misinterpretations. The results of the present study shed light on the misinterpretation that the elasticity of substitution is a "magic tool" for perpetual economic growth. Instead, the finding as an increase in the minimum marginal product of labor enhances the rate of growth for output per capita is shown. This result appears as an appropriate policy tool to be set in the first place. On the other hand, the result as output per capita is a decreasing function of the elasticity of substitution is demonstrated. Moreover, the result as at steady-state an increase in elasticity of substitution decreases the output per capita and decreases the capital per labor is demonstrated. Furthermore, it is demonstrated at steady-state that an increase in elasticity of substitution strictly decreases capital share. This study challenges the studies reporting that there is a threshold of elasticity of substitution for which there is no steady-state equilibrium and for which ever-sustained growth is entailed. We believe that the extensive approach proposed in this study will be a source for different points of view. The future studies which will be based on existing literature on modern growth theory should consider the findings of the present study. Future studies may suggest that the economic implications of limiting the behavior of factor productivities are deeper than previously considered. This gives more room to design alternative growth-enhancing policies across the world.

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APPENDIX

For our purposes; first of all, we have to focus on the formulation proposed in de La Grandville (1989), which introduced a variant of the CES production function. That is given in (A1).

$$f(k) = A(\sigma)\left(\left(1 - c(\sigma)\right)k^{\frac{\sigma-1}{\sigma}} + c(\sigma)\right)^{\frac{\sigma}{\sigma-1}} \tag{A1}$$

De La Grandville (1989) defines the CES function parameters as:

$$A(\sigma)^{\frac{\sigma-1}{\sigma}}\left(1 - c(\sigma)\right) = \beta(\sigma) \text{ and } A(\sigma)^{\frac{\sigma-1}{\sigma}}c(\sigma) = \alpha(\sigma) \tag{A2}$$

Comparing the parameters in (A2) with the CES production function given in this study by (1), for $\sigma>1$, we obtain the relations given in (A3):

$$\beta^*(\sigma) = F_K(K,0)^{\frac{\sigma-1}{\sigma}} \text{ and } \alpha^*(\sigma) = F_L(0,L)^{\frac{\sigma-1}{\sigma}} \tag{A3}$$

On the other hand, assume the other case, $\sigma<1$. Comparing the parameters of the production function (A1) with the CES production function given in the present study by (2), leads the following identities depicted in expression (A4):

$$\beta^*(\sigma) = F_K(K,\infty)^{\frac{\sigma-1}{\sigma}} \text{ and } \alpha^*(\sigma) = F_L(\infty,L)^{\frac{\sigma-1}{\sigma}} \tag{A4}$$

Factors Influencing Prices of Residential Real Estate in Turkey

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ABSTRACT

In many nations, the real estate sector is a very important determinant of economic productivity and improvement. It is critical to conduct market research and gain a thorough understanding of the market before making house-buying decisions. In real estate investing, market analysis is an underappreciated asset. In actuality, the most significant aspect of analysing a real estate investment is market analysis. Although all the real estate is local, the main macroeconomic factors have an influence on all local markets. So, market analysts should check the interest rates, present and proposed inflation fluctuation, population expansion, interest rates, and GDP growth. These elements have an effect on the economic base which besetment the subject property's progression or reduction. Interest rates can affect the cost of borrowing and mortgage change rates in capital flows can also have a direct impact on the Demand and supply variables for a property. There are also links between inflation and any limited-supply goods. Inflation has a significant impact on a wide range of industries. The utility market, banking, and energy are the most affected. In fact, because the Gross Domestic Product Growth rate is the main influence on real estate pricing and rent, real estate investments offer a direct method to benefit from these economies' significant growth. And regarding the increase in the population, it's also important to comprehend the fundamental causes of population growth.

Keywords: *House Price Index, Macroeconomic Factors, House Pricing, Inflation, Real Estate Pricing, Interest Rate, Gross Domestic Product, Population.*

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INTRODUCTION

Pricing is the result of an unpredictable and uncontrollable conflict between demand and supply within a market, also known as the price mechanism. Now Turkey's economy has undergone a significant shift over the last decade, and its economic foundations are rather steady. Turkey, in regard to its GDP growth, occupies the world's 17th largest and also ranked as the 6th largest in Europe. A huge part of the total Gross Domestic Product of Turkey's economics comes from the real estate sector which accounts for 19.5%. FDI inflows increased to USD 12.5 billion in 2012, with real estate and buildings accounting for USD 1.6 billion of the total. The real estate industry, often known as the property market, is an important economic component that has contributed to economic growth. In Turkey, the real estate market accounts for more than 23.5% of the country's GDP. Turkey's real estate industry has grown at a rapid pace over the last few generations, and it is now one of the world's leading real estate markets. As a result, and to understand the growth of the residential real estate market, we must comprehend the demand and supply variables, and also the reasons that cause changes in price (Burnside et al, 2011). The real estate or housing market differs significantly from other markets for commodities and services. This is because the housing market acts as both a commodity and an asset for investment. As a result, both sides will be included while evaluating the housing market.

RESEARCH OBJECTIVES

According to the purpose of this study work, four selected macroeconomic variables (GDP, interest rate, inflation rate, and population) will be used to assess the long-run impact on housing prices in Turkey. This research is important because, up until now, the majority of studies had looked at the causes of housing prices from a macroeconomic correlation point of view, but they had mostly been conducted in the United States and Europe, making this research particularly significant. Individual countries in Asia, such as Japan and China, have also been subjected to research, as has the situation in the United States. Consequently, in both countries, this study contributes to the current literature by inspecting the impact of macroeconomic variables on house values. It is possible that policymakers would find the information presented to be valuable in modifying or implementing new policies for their respective countries in order to achieve economic stability. Furthermore, this research will be useful to future academics who are interested in the economies of Turkey, according to the authors. Finally, the study will promote knowledge among the general public about the macroeconomic factors that influence home prices in the nations that have been chosen for research. People will be able to understand the influence of their spending decisions on the country as a result of this information (Muhammad, A., & Yvonne, Lee., 2022).

The price of a House is something so complicated because its regarded as the highest product the customer will pay the highest amount of money for it and generally every person through his/her life will buy and sell 1 time and sure the buyer or seller should know what are the indicators that may affect this amount of money from year to year beside the difference of price between one home to another based on its hedonic characteristics, through this study we will check by evidence if there is a correlation or no relation between the independent macro-economic variables which are interest rate, GDP, population and inflation rate in Turkey and other countries. We will check if the interest rate has an effect on the House Price Index and also the Population if there is a correlation with the House price index besides the gross domestic product, whether there is a connection between its change and the house price index change and finally the inflation and its influence on the house price index. This will be done through many tests and will apply and get the result to define the relationship and have final findings from these tests.

LITERATURE REVIEW

Analysis of the Turkish Housing Market's Efficiency is the Investors' main goal to raise the value of their money by trading multiple investment tools based on the premise of minimal risk high returns. Financial or non-financial investing instruments are available. Deposits, government and private sector bonds, treasury bills, and other financial investment instruments give a fixed or variable income, such as stocks, funds, and currencies. Esra, A., & Ünal, S. (2019). prices are produced completely at random, regardless of previous prices, and future prices cannot be predicted. Fama (2010). Moreover (Coşkun 2016) states that According to the study, even in consumption house ownership, the view of housing as a wealth protection mechanism and the hope that it will protect/increase its worth might contribute to a certain investment incentive.

Turkey's Geographical Strategic Location Between Europe and Asia

This is one of the factors that promoted the Real Estate Market growth in Turkey. Turkey is located between Europe and Asia continents, and hence functions as a crossroads. Istanbul's massive airport, which is the largest in the Middle East and Europe, as well as Ankara's airports, are a convenient way to travel to important cities in Europe and give Istanbul and Turkey very important positive points between the continents, Asia, Africa, and the Middle East, with an average of Four hours direct flight. Turkey's geographical location makes the trade between those continents has converged, leading to a rapid increase in warehouse and logistics infrastructure (Deloitte, 2013).

Turkey's Population

Also is another factor that promoted the Real Estate Market growth in Turkey. Turkey's population is also a pull factor for the real estate market, since a large population means a greater demand for housing, causing the real estate market to flourish. In 2015, Turkey's population was estimated to be 78.67 million people. Turkey's population is quickly increasing, with an estimated population of 88.5 million by 2030. As a result, Turkey's growth rate is higher than other European countries. Most of this population is between the ages of 15 and 65, resulting in a robust labour force (Deloitte, 2013). Turkey was also ranked 69th in 2014 Conducting Business Report. What is new in the real estate world is that land and space, whether it is under the road and infrastructure organisation plan or not, agricultural or non-agricultural, may be purchased by foreigners, so finally as a result, the foreigners can own property in Turkey.

Residential Real Estate Pricing Determinants

In numerous countries, the residential real estate market is influenced by a variety of factors. The size of the real estate market is one of the characteristics included in this study's analysis. Several factors influence the price of residential real estate. Inflation Rate, Gross Domestic Product, and Interest Rates (Mak, Choy, & Ho, 2012). The residential real estate market is mainly influenced by the Interest rate. In developed countries, the fluctuation of interest rates has a significant impact on a person's capacity to purchase residential real estate in that country.

This is due to the fact that a decrease in interest rates raises the cost of obtaining money to pay for real estate prices in a country. Interest, on the other hand, raises the cost of obtaining loans or mortgages, which reduces demand for residential real estate prices. Mortgage rates are a key factor in property prices. The capital flows are affected by interest rates, demand and supply for the capital, and investor returns (Liow, & Huang, 2005). Office renters have lengthier contracts that cannot be amended during a downturn (Case, Shiller, et al). (2005). Different land costs apply. Land prices are a consequence of real estate prices, not a cause because greater property prices raised the land prices and the demand for land, which in turn increased the prices of real estate (Gallagher, 2011). Inflation reduces money's buying power. The customer price index tracks retail prices for home products and services to measure inflation (Liow, Ibrahim, and Huang, 2005).

Selim (2008) suggests using a hedonic regression model to study urban and rural housing costs. According to the study, the water system, kind of home, pool, number of rooms, house size, construction style, and location influence property values. According to Mikhed (2009), falling U.S. home prices are justified by borrowing rate, income, stock, market, population, housing rent, wealth, and building expenditures. The study used unit root and cointegration tests on aggregate data. Lack of power stationarity and regional housing market information might hinder the analysis. Therefore, cross-sectional dependence-resistant panel data stationarity tests were applied. Previous U.S. residential real estate research looked at many parameters. Furthermore, Doerner (2011) revealed that the Florida study used a special 15-year panel to test for symmetrical effects during property booms and busts. The paths through the change in home values can affect city revenue per capita. Egert and Mihaljek (2007) employed the panel technique to determine the house price dynamics in eight economic growths in east and central Europe, as well as the 19 OECD countries, in a similar way to the previous study. The study lays the groundwork for real-world interest and demographics. The analysis also confirms the relevance of transition-specific elements such as housing quality improvement and residential marketing in the study. In CEE and OECD countries, the real interest rate, gross domestic product, and housing credit all have a considerable impact on property prices, according to the study. In the nations analysed, demography and labour market development play critical roles in residential real estate price dynamics. As per Muli (2011) study which investigates the relationship between lending mortgages and Kenyan real estate prices. In recent years, there were exceptionally huge changes in property values, from 2006 to 2010, a quarterly database was used for the study. The dynamic of the model was developed using multiple regressions to examine the impact of home prices and credit. The authors of this study come to the conclusion that fluctuations in home prices are caused by changes in mortgage lending. Muthee (2012) investigated the connection between Kenya's economic development and house prices. While tracking the Hass Housing Price Index and Kenya's GDP figures throughout a five-year period, data were gathered from various sources but connected in a similar or equal time and period, reviewed, subjected to regression analysis, and rated for validity. The findings showed that some factors are related to the quarterly change in GDP and the change in HPI. According to the statistics and analysis, Residential real estate is a powerful asset sector that has been overlooked by many investors. Investors' varied concerns in an attempt to provide an acceptable assessment of the manner in which real estate values are influenced, which has an impact on the status of the annual rental rate.

Opportunities for Real Estate Investing:

As an emerging economy, Turkey's economy necessitates infrastructure investment in all sectors, including residential and non-residential real estate, including energy and power and also transportation.

Turkey intends to attain the following goals by 2023. Being one of the top 10 performing countries by 2023. Aiming for a staggering 2 trillion USD of the gross domestic product by 2023. Increased export deals to more than 500 billion dollars.

By raising export volume from 152 billion dollars to 500 billion dollars, the world trade share will rise to 1.46 per cent. Construction enterprises must also set their goals in accordance with the country's goals.

- **Infrastructure**

Increase the length of the speed train track from 888 kilometres to 10.000 kilometres. The Turkish State Railways has set aside 514.9 million Turkish Liras for the construction of logistic communities. The government intends to construct 16 more logistic centres. TOKI, Turkey's Housing Development Administration, aims to develop 1 million residences for Turkish citizens by 2023.

- **Urbanisation**

Turkey has experienced massive urbanisation during the last six decades. The proportion of the population in Turkey who were living in cities has climbed from 25% in 1950 to almost 75% presently. Urbanization's demands have grown over time, especially in secondary cities with considerable infrastructure and investment requirements.

- **Tourism**

By 2023, the government hopes to expand the number of tourists to 50 million by building additional facilities like hotels, health centres, and sports centres to attract tourists to come to Turkey.

SWOT Analysis Turkey's Real Estate Market

To make a brief study of the Opportunities, Threats, Strengths, and Weaknesses, in the Turkish Real Estate Market we can conduct the below points:

- **Strengths**

Several elements have influenced the development of the real estate sector concept, including Turkey's strong and sophisticated infrastructure.

Legislation, investment, and banking that is appropriate.

Foreign investors continue to receive government backing.

Turkey has a large population (over 82 million).

Turkey is regarded as one of the most appealing tourist destinations in the world.

The government and municipalities are planning urban renovation initiatives in the foreseeable future. The updated regulation that had been settled and published to save The investor who became able to buy and sell under government supervision.

- **Weaknesses**

The irregular housing practices based on Studies done in (2008 by Turhan 5-6).

A huge number of residences that have been licensed do not meet the criteria for obtaining a mortgage. Land is expensive, particularly in large cities like Istanbul, Antalya, and Ankara.

- **Threats**

Sector volatility, as is expected. The earthquake rate in Turkey is unusually high, particularly along the Mamara zones, such as Istanbul and Bodrum

- **Opportunities**

House demand exceeds supply, indicating growth potential
House quality has increased to meet seismic standards.
Increasing demand for residences and shopping malls

As part of the urban rehabilitation process, run-down districts and residences are demolished and replaced with contemporary structures. (2017, Istanbul Investment House) In Turkey, there is a thriving real estate sector.

Dependent and Independent Variable

Dependent variable (House Price Index)

HPI is the abbreviation of House Price Index, it is an index that has been calculated on a quarterly basis that tracks the changes in the cost of single-family homes in the United States. By collecting the data on the median price changes of houses that have recently been resold or refinanced, the Home Price Index (HPI) serves as an indicator of trends in home pricing. The Home Price Index (HPI) is compiled and distributed with the assistance of data provided by the (Freddie Mac) Federal Home Loan Mortgage Corporation and by the Federal Housing Finance Agency (FHFA) and also, the Federal National Mortgage Association (Fannie Mae) (JASON 2022). The Federal Housing Finance Agency (FHFA) keeps track of the price of single-family dwellings. The House Price Index (HPI) is a single-family house value index maintained by the (FHFA). Since the mid-1970s, the index has calculated property prices using data from purchases and

re-mortgage in the 50 states and over 400 U.S. cities. From the mid-1970s to the present (HPI) House Price Index measures changes in single-family home values and also it is a weighted index. It calculates the average price change in repeat property sales or refinancing (Danielle 2022). The function of the House Price Index is that the HPI is a tool for analysing housing market movements, which have a considerable economic impact. The HPI can be used by academicians to better analyse changes in home ownership, prepaid expenses, and mortgage defaults. Monthly, quarterly and annual HPI index reports are issued.

Independent Variable

- **GDP**

GDP calculates the monetary value of a nation’s finished goods and services produced during a specific time frame (i.e., which is bought by the end-user on an annual or quarterly basis). It is a statistic that measures the total amount of products produced within a nation’s borders. GDP is made up of goods and services produced for market consumption as well as some non-market output, like military and educational services given by the government, GDP does not account for all forms of production. There are some activities excluded from the calculation such as unpaid labour (for example the one that is done at home or for charity) and black-market transactions because those are difficult to measure and value.

- **Inflation**

Inflation is a measure of the ability to buy through the value of money. It is characterised as the rate of change in the cost of goods and services over time (rated on an Annual basis in general). We can define it by the fluctuation of a product’s price within a specific period of time and it affects the ability of consumers to buy because when inflation occurs people can no longer afford to purchase as before the inflation.

Inflation is measured in percentages and takes into account a variety of elements, ranging from broad metrics such as a country’s general cost of living to more particular necessities such as fuel, heating expenditures, groceries, and even the cost of a haircut (The Street Staff 2022).

Inflation-Related Terms Glossary1- Deflation, on the other hand, occurs when the cost of goods and services falls, usually as a result of monetary supply change. On the plus side, consumers' purchasing power grows, i.e., they "get more for their dollar," yet deflation is usually associated with a slowing economy.2- Disinflation, it's different from deflation, merely implies that inflation is rising more slowly than predicted. For example, if CPI monthly was 4.2 per cent in June and 3 per cent in July, prices deflated by 1.2 per cent in June but are still rising at a 3 per cent annual rate in July.3- Hyperinflation is extremely high inflation that is still increasing. when the percentage is higher than +1000. Hyperinflation can harm an economy and cause a currency to fail. 4- Stagflation is defined as a dangerous combination of high unemployment, high inflation, and no or little economic growth (The Street Staff 2022).

- **Interest Rate**

The interest rate is a percentage of the principal, or the amount borrowed and is added on top of the base loan amount as additional fees to the borrower. The phrase used to define a loan's interest rate is the annual percentage rate or APR. Money accumulated in a bank, credit union, or both can generate interest through certificates of deposit or savings accounts. The yearly percentage yield refers to the revenue earned on certain bank accounts (APY) (Caroline 2021). The principal, or total borrowed, is what is charged as interest on a loan. The cost of borrowing is represented by the interest rate, which is also the rate of return for the lender. Typically, the amount to be repaid exceeds the amount borrowed since lenders seek a refund amount for the duration of time of lending the amount of money. The lender can have invested the money during that time instead of making a loan, earning revenue from the asset. The difference between the total amount repaid and the original loan amount is the interest.

Independent Variable (Population)

- **Population**

is a distinct group of people, whether it is a nation or a collection of people with a common trait. A population is a set of people from which a quantitative sample is taken in order to conduct statistical analysis. A population is a group of individuals who are similar in some way. A sample, not the

entire population, is a statistically significant subset of it. As a result, the estimated standard deviation, or standard error, of a statistical analysis of the outcomes of a sample from the entire population must be presented. Only a population-wide study would be free of sampling error. A population is a unique group of people who share a common identity, citizenship, or trait. (Osikhotsali 2021). Many, if not all, government and commercial decisions are based on the results of large and local population surveys. Population Examples in the Real World.

DATA COLLECTION AND ANALYSIS:

The researcher collects secondary data in order to check the established connection between the variables. Population, inflation, GDP, and interest rate are all used in this study (Independent Variable) and the House Price Index (dependent Variable). We obtained secondary data from the Global Property Website guide for the House Price Index for a ten-year period. We acquired secondary quarterly data for the period of 11 years from Fred Stlouisfed website Data for the interest rate and secondary 11 years period of time data on a quarterly basis from Trading Economics Website Data for the inflation rate. We also obtained secondary quarterly data from Country Economy Website Data for GDP and annual data for a period of 11 years as secondary data for the population from the Country Economy Website. On the basis of the publishers' credibility, the data's validity, accuracy, and correctness were presumed. Data collected for studying will be tested by many statistical tests in order to check its validity using statistical applications: SPSS "Statistical packages for social scientists" and EViews statistic which are used to apply the below-mentioned Tests on data variation and relationship between all data each of them with each other and between the dependent and independent variables:

Descriptive Study - VIF (Multicollinearity) Test - CUSUM Test - Regression and Multi Regression Test - Normality Test - Plot Point Test - White Heteroscedasticity Test - Autocorrelation (Durbin Watson) Test – Heteroscedasticity Test - Unit Root Test - Kolmogorov-Smirnov Test - Correlation Test.

Descriptive Study Result

After applying a descriptive test by EViews for all the variables' data in order to check if its normally distributed we conclude that inflation rate results are not normally distributed since all results are negatively different that equal to the conditions to its not normally distributed.

Table 1: Descriptive Study Result

Descriptive Study	Condition	Housing Price	Interest Rate	Inflation Rate	GDP	Population
Kurtosis	**< 3**	2.3	1.78	5.41	2.48	1.71
Skewness	**between -0.5 to 0.5**	0.47	0.43	1.59	-0.39	0.04
P value	**>0.05**	0.27	0.12	0	0.44	0.21
Jaruque bera	**Near to 0**	2.5	4.09	29.3	1.61	3.04

Unit Test

The unit test was applied in all possible ways, although it's enough to have only 1 result for each variable (less than 0.05) so it means the data for this variable is stationary, so we can proceed with testing data with a regression test and the result of testing will be reliable results. From the below table for the summary of test results done by EViews, we can find that all second difference results are significant since all of them are less than 0.05 so the data is stationary.

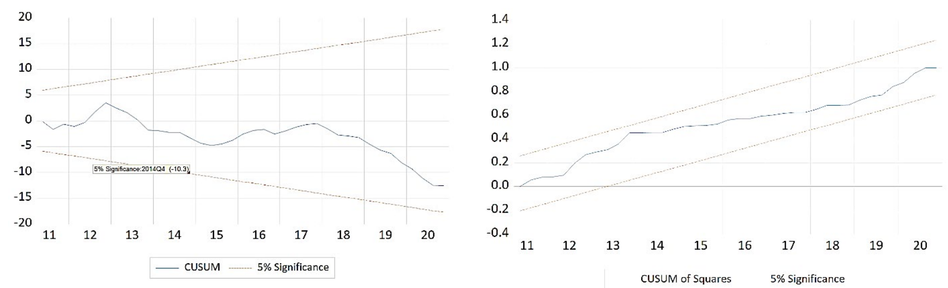
Table 2: Unit Test Result

Unit Test	GDP	HPI	INTRST_R	INFL_R	POP
Level with Intercept	0.2433	0.9999	0.1241	0.2225	0.5981
2nd Diff with Intercept	0	0	0	0	0.0001
Level with NA	0.6064	0.9987	0.3868	5926	0.8076
1st Diff with Intercept	0	0.602	0.0038	0.0003	0.7823
1st Diff with Trend & Intercept	0	0.2679	0.0208	0.0018	0.9261
1st Diff with None	0	0.5884	0.0002	0	0.3235
Level with Trend and Intercept	0.7264	0.8578	0.3559	0.0676	0.2808
2nd Diff with Trend & Intercept	0	0.0001	0	0	0
2nd Difference with NA	0	0	0	0	0

CUSUM Test & CUSUM Square Test

The test Done using EViews App, fluctuation line should be in between the limitation predicted lines in order to proceed with testing. The graphic result for CUSUM is in between the 5% significance lines. This translated that our regression equation is stable over the period. Its purpose is to determine whether or not the coefficients of the regression model are shifting in a predictable manner.

Figure 1: EViews CUSUM & CUSUM SQUARE Test Output



Correlation Test:

To test the hypotheses, Pearson correlation coefficient test was applied.
The association degree between two variables is defined as a correlation.
The correlation coefficient ranges from -1 to 1.
Perfect positive correlation represented by 1.
There is No correlation represented by 0.
Perfect negative correlation represents a negative 1.
below table of correlation test result

Table 3: Correlation Test Result

Correlation	GDP	HPI	INFL_R	INTRST_R	POP
GDP	-	**0.276060**	0.000507	-0.490408	0.393096
HPI	0.276060	-	0.612603	-0.144372	0.968985
INFL_R	0.000507	**0.612603**	-	0.476671	0.648274

INTRST_R	-0.490408	**-0.144372**	0.476671	-	-0.116035
POP	0.393096	**0.968985**	0.648274	-0.116035	-

As per Table 3 for correlation test result, the HPI Correlation is significant with all independent variables except Interest Rate, the relation with Interest rate is insignificant since it is 0.3487 which is higher than 0.05.

Figure 2: EViews Correlation Test Output

Covariance Analysis: Ordinary
Date: 05/19/22 Time: 14:15
Sample: 2010Q1 2020Q4
Included observations: 44

Correlation t-Statistic Probability	GDP	HPI	INFL_R	INTRST_R	POP
GDP	1.000000				

HPI	0.276060	1.000000			
	1.861408	-----			
	0.0496	-----			
INFL_R	0.000507	0.612603	1.000000		
	0.003288	5.022986	-----		
	0.9974	0.0000	-----		
INTRST_R	-0.490408	-0.144372	0.476671	1.000000	
	-3.646856	-0.945541	3.514097	-----	
	0.0007	0.3498	0.0011	-----	
POP	0.393096	0.968985	0.648274	-0.116035	1.000000
	2.770596	25.41161	5.517798	-0.757109	-----
	0.0083	0.0000	0.0000	0.4532	-----

Regression Analysis

The regression test applied to check the significance of the relationship between the dependent variable and independent variable, through the result of probability in the regression test using EViews statistics calculation system if P value is greater than 0.05 so its insignificant relationship.

As per the below result summarised table, the interest rate results are insignificant. R-Squared: tells us how much the independent variable is representing the dependent variable.

Coefficients: interpret if the independent variable increased by 1, how much the dependent variable will be verified.

Table 4: Regression Test EViews Result

Regression	GDP & HPI	INTRST_R & HPI	INFL_R & HPI	POP & HPI
Coefficients	0.0003	-1.2142	4.6902	0.000008
P value	0.0870	0.3799	0.0000	0.00000
R-Squared	0.0697	0.0208	0.3759	0.94922

VIF / Multicollinearity Test

This kind of test is typically used to examine if the independent variables are similar in fluctuation so it tests the relation between them, and if the test concluded in a multicollinearity between them, then we can draw the conclusion that the interpretations are not entirely accurate. When VIF value is greater than 5 then we consider it the problem of Multicollinearity

Table 5: VIF Test EViews Result

VIF / Multicollinearity Test	Result
Inflation	3.917
Interest Rate	2.555
GDP	1.555
Population	3.289

RESULTS

Correlation Test Result Summary

Inflation has a weak positive relation with HPI
GDP has a weak positive relation with HPI
Interest Rate has insignificant relation with HPI
The population has a strong positive relationship with HPI

Regression Test Result Summary:

Inflation has a significant relation with HPI
GDP has a significant relation with HPI
Interest Rate has insignificant relation with HPI
The population has a significant relation with HPI

Our study covers the period of 2010 to, a duration of 11 years. Checking the relation of our variables upon HPI we concluded that, the house price index's best relation is with population since it has strong positive relation and its relation with house price the dependent value is significant and also in linear regression there is a positive correlation.

After it, the inflation rate since its relation is significant even if the relation is weak as per the correlation test but still, all tests gave us the good relationship between those two variables population and house price index.

As for the GDP, the result of regression gave us the answer to our thesis's main question that the relation with the house price index is significant but weak relation as per the correlation test.

While for the Interest rate the regression result tells us that the relation is insignificant with the HPI.

CONCLUSION

The purpose of the study was to look at the factors that influence residential real estate values. Interest rates, inflation, gross domestic product, and population growth were taken into account when making the decision. The findings show a good link between the prices of residential real estate and the factors examined. According to the study's findings, real estate house prices significantly depend on factors including interest rates, inflation, GDP, and population growth. Therefore, the macroeconomic factors under investigation, including a country's population increase, successfully explain the rise in housing prices in Turkey. Despite the fact that the study found a conflict between interest rates and home prices.

The study goes on to say that, in light of the findings, there was an overall increase in housing prices over the time covered by the study, which serves as a signal to the constantly evolving study components (inflation, interest rates, GDP, and population growth). Therefore, it can be said that the study variables are important justifications for the housing prices in Turkey given in the context of the study. Therefore, it should be taken into consideration of the macroeconomic variable is required to control housing prices.

Glaeser et al. (2010) revealed that, between 1996 and 2006, the prices of real estate climbed by 53 per cent when compared to the prices of essential commodities; yet, low-interest rates could only explain a fifth of the increase in price over this time period.

Those who studied the real estate prices in 18 industrialised countries and established a substantial correlation between real estate price and monetary policy, such as Greiber and Setzer (2007), have corroborated this. They came to the conclusion that the interest rate was the most important factor that influenced the demand for real estate. Julius (2012) provided information on the factors that affect the price of residential real estate in Nairobi. The goal was to examine the real estate market's influencing elements in light of the scant or non-existent empirical data that was available. According to the analysis, interest rates, money supply, inflation, and employment rates, as well as population dynamics, all affected home values. Data from the Central Bank of Kenya and other Kenyan statistical agencies, such as Hass Consulting Ltd., were used in the study.

LIMITATIONS OF STUDY

Our thesis was studying a statistical data set for a period of 11 years starting from 01/01/2010 until 31/12/2020. Collecting detailed data on a quarterly basis was not easy for all the variables since most websites were publishing the statistics on an annual level, and the more sample size you have, the surer you can be of the experiment's outcome. You should have a big enough data set to see if the results are statistically significant. If your sample size is too small, you will encounter sampling errors. Financially it was very expensive in regard to collected data from paid websites and also the subscription to programs that helps in applying the needed statistics tests for example SPSS and EViews.

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*Stratejik İstihbarat Analizinde Öngörülebilirliğin Doğası: Kaos Teorisi Işığında Yeni Bir Muhakeme Denemesi**

Müberra HUDOĞLU[1]

Gökhan AK

ÖZ

Stratejik istihbarat analizi, istihbarat türleri arasında öngörülerin en kritik olduğu alandır. Stratejik istihbarat analizinde öngörülerde bulunma adına bilimsel metodoloji ve nesnel bilgi kullanılmaya çalışılır. Bu açıdan stratejik istihbarat analizi, istihbaratın kritik açıklama yollarından birini teşkil eder. Ancak, analistin ulaştığı sonuçlar bilimsel bilgi gibi mutlak değilken, istihbaratın yapısı da doğası gereği genelde sınırlıdır. Dolayısıyla, bu çalışmanın sorunsalı, anılan sınırlı yapının –henüz- 60 yıllık bir geçmişi olan Kaos Teorisi ile açıklanabileceği üzerine çatılmıştır. Zira Kaos Teorisi, istihbaratın öngörülebilirlik üzerindeki sınırlı yapısını açıklamasının yanı sıra, analist için Kaos ile karşılaşması durumunda Kaos'u sezebileceği ve kaotik yapıdan yola çıkarak sınırlı, ancak daha sağlıklı ve nesnel bir öngörüde bulunabileceği bazı ipuçları barındırır. Bu ipuçlarına, Kaos Teorisi'nin özellikleri soyutlanarak ulaşılabilir. Böylelikle soyutlanan özellikler vasıtasıyla incelenen olgu üzerine kaotik muhakeme süreci işletilerek, analist için yeni bir anlayış ve muhakeme olanağı geliştirilmiş olunur. Dolayısıyla, konu ve kapsamı stratejik istihbarat analizi ve Kaos Teorisi etkileşimi olan bu çalışma, bir yandan Kaos Teorisi ile ilgili farkındalık yaratmayı, öte yandan stratejik istihbarat analizinde öngörülebilirliğin doğası üzerine Kaos Teorisi kapsamında yeni bir düşünsel süreç ve muhakeme sunma amacını gütmektedir.

Anahtar Kelimeler*: Stratejik İstihbarat, Kaos Teorisi, İstihbarat Analizi, Karmaşık Sistemler, Öngörülebilirlik.*

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The Nature of Predictability in Strategic Intelligence Analysis: A New Reasoning Try in the Light of the Chaos Theory

ABSTRACT

Strategic intelligence analysis is the most critical area of prediction among intelligence types. Scientific methodology and objective knowledge are used to make predictions in strategic intelligence analysis. In this vein, strategic intelligence analysis constitutes one of the critical scientific branches of intelligence. While the analyst's conclusions are not absolute, like scientific knowledge, the nature of intelligence is often limited by its nature. Hence, the problem of this study is that this limited structure can be explored and explained with the Chaos Theory, which has a history of 60 years. Because, in addition to explaining the limited structure of intelligence on predictability, the Chaos Theory contains some clues for the analyst, in case of encountering Chaos, that one can sense Chaos and that can make a limited but more sound and objective prediction based on the chaotic structure. These clues can be reached by isolating the features of Chaos Theory. Thus, a new understanding and reasoning ability is developed for the analyst by operating a chaotic intellectual process on the phenomenon examined through the abstracted features. Thus, this study, whose subject and scope is the interaction of strategic intelligence analysis and Chaos Theory, aims to raise awareness about Chaos Theory on the one hand and to present a new thought process and reasoning within the scope of Chaos Theory on the nature of predictability in strategic intelligence analysis, on the other hand.

Keywords: *Strategic Intelligence, Chaos Theory, Intelligence Analysis, Complex Systems, Predictability*

GİRİŞ

Stratejik istihbarat analizi sürecinde, öngörüler bağlamında nesnel sonuçlara ulaşmaya çalışılır. Bunu yaparken analist, sosyal bilimlerde kullanılan bilimsel yöntemlerden faydalanmaktadır. Klasik bilimsel paradigmanın temelini ise, öngörülebilir bir dünya sunan determinizm oluşturmaktadır. Determinizm, ihtiyaç duyulan bilgilerin bilinmesi durumunda, sistemin gelecekteki durumunu hatasız bir biçimde tahmin edebilmeyi öngören bilimsel anlayıştır. Ancak Kaos Teorisi, doğrusal olan bir dünya algısından, doğrusal olmayan bir dünyayı kabullenme sürecini başlatmıştır. Dolayısıyla, evrendeki her şeyin tahmin edilebilir olduğunu düşünen bilimsel düşünceden, tahmin edilemezliğin doğrusal olmayan sistemlerin doğası olduğu düşüncesi Kaos Teorisi ile bilim dünyasına girmiştir.

Bu çalışma, ilk aşamada öngörülebilirliğin doğasını ve istihbaratın doğasında bulunan belirsizliği Kaos Teorisi üzerinden inceleyecektir. İkinci olarak kaotik sistemin özellikleri ortaya konacak ve bu özelliklerin soyutlanması ile muhakeme biçimi açıklanıp örnekle somutlaştırılacaktır. Son olarak ise, Kaos Teorisi'nin istihbarat analizindeki önemi irdelenerek, çalışma elde edilen tespitlerin sonuç kısmında ortaya konmasıyla nihayete erdirilecektir.

Bu çalışmanın birinci araştırma hipotezi (h_1), istihbarat analizinin doğasındaki belirsizlik ve öngörülemezliğin doğasının, karmaşık bir sistem olarak kabul edilen uluslararası ilişkilerin kompleks yapısından kaynaklandığı, dolayısıyla Kaos Teorisi ile açıklanabildiğidir. Böylelikle istihbarat olgularında analistin çoğu zaman karşılaştığı belirsizlik ve öngörülemezlik, bilimsel bir zeminde açıklanmış olur. Bu hipotez (h_1), çalışmanın ilk bölümünde sınanacaktır. Bu çalışmanın ikinci araştırma hipotezi (h_2) ise, kaotik yapılı bir sosyal olgunun kaotik sistemin içkin özelliklerini barındırdığı, dolayısıyla analistin kaotik sistemin özelliklerini sosyal olguya uygulaması halinde, sistem ile ilgili birtakım bilgiler edinebileceğidir. Kaos Teorisi'nin özellikleri soyutlanarak sosyal olgu üzerinde kaotik muhakeme süreci işletilmesi halinde analist, kaotik sistem ile ilgili öngörüler bağlamında birtakım ipuçlarına ulaşabilir. Bu araştırma hipotezi (h_2) ise, çalışmanın ikinci bölümünde sınanacaktır.

Yaklaşık 60 yıllık geçmişi ile Kaos Teorisi, yeni bir teori olması sebebiyle, teoriyle ilgili sosyal bilimler alanyazını bu anlamda nispeten zayıf kalmıştır. "Karmaşık Sistemler" ile ilgili yeni yeni bir alanyazın oluşmaya başlamış olmasına karşın, karmaşık sistemlerin alanı olan "Kaos Teorisi" başlığı altında "Stratejik İstihbarat Analizi"ne yönelik Türkçe ve İngilizce alanyazında herhangi bir çalışmaya rastlanmamıştır. Bu durumda, çalışmanın alanyazına yapacağı muhtemel etkin katkı bağlamında esas önemini vurgulamaktadır. Esas olarak nitel araştırma metodolojisini benimseyen bu çalışmada, elde edilen veriler betimsel olarak irdelenmiş, düzenlenmiş ve yorumlanmıştır. Sorunsalla ilgili bilimsel veriyi bilimsel kitap, makale, proje, tez, rapor gibi ikincil veri kaynaklarının kapsamlı bir alanyazın taraması ile elde eden ve belge analizi, içerik analizi ve yorumsamacılık gibi bilimsel araştırma yöntemlerinden faydalanan bu çalışma esas olarak karmaşık sistemler ve Kaos Teorisi'nin istihbarat analizinde kullanımı üzerine bir akıl yürütme ve tartışmayı teşvik etmeyi amaçlamakta olup, özellikle bu açıdan, Türkçe alanyazın için hem bir başlangıç olmayı hem de gelecek çalışmalara öncülük etmeyi hedeflemektedir.

STRATEJİK İSTİHBARAT ANALİZİ VE ÖNGÖRÜLEBİLİRLİĞİN DOĞASI

Stratejik istihbarat, bir ulusun barış veya savaş zamanında şekillendirdiği ulusal politikayı desteklemek amacıyla milli güç unsurlarının bir arada veya etkin bir biçimde kullanılması amacıyla, milli güvenliği sağlamada ve geleceğe yönelik dış politika oluşturmada karar alıcının ihtiyaç duyduğu tüm bilgileri içeren özel bir analiz biçimidir (McDowell, 2009: 10). Stratejik istihbarat analizi, bölgesel ve küresel eğilimleri takip ederek sürecin, politikaların hangi istikamette ilerlediğini tespit edip, karar alıcının geleceğe yönelik stratejiler tasarlanması için geleceği şekillendirecek faktörleri belirler (Fingar, 2011: 53).

Temel istihbarat türlerinden birini teşkil eden stratejik istihbarat, istihbarat analizinde öngörülerin en elzem olduğu alandır (Kuosa, 2014: 17). Stratejik istihbaratın; devrimler, siyasi ve ekonomik dönüşümler-kırılmalar gibi stratejik sürprizler ve tehditler açısından ufuk ötesini görmesi beklenir. Bu sebeple, stratejik istihbarat analizi belirsizlikleri ortadan kaldırıp, devlet ve toplum çıkarlarını korumak adına gelecek öngörüsünde bulunur. Clauser'a (2008: 24) göre, basit bir istihbaratın amacı bile aslında öngörüdür. Zira stratejik bilginin toplanma süreci bir tarafa, karar alıcılar toplanan bilgileri nesnel bir biçimde değerlendirecek analistlere ihtiyaç duyar. Dolayısıyla, stratejik istihbarat analizi, analitik sürecin işletilmesi gereken bir alandır (McDowell, 2009: 22). Çalışmaları İstihbaratın örtük olarak sosyal bilim olarak tanınmasını sağlayan Sherman Kent önderliğinde, hipotezlerin oluşturulup nesnel bir biçimde test edildiği bilimsel bir metodoloji kazanan stratejik istihbarat analizi, istihbaratın kritik bir bilimsel dalı (Steury, 1994: 6) olarak istihbarat alanında vazgeçilemez yerini almıştır.

İstihbarat analisti ise, anlamsız veri yığınlarını ayıklayıp anlamlı bilgiye dönüştürmeye çalışır (Hammond, 2010: 682). Her açıdan istihbarat, her daim belirsizliklerle uğraşır. İstihbarat analizinde geleceği öngörememe,

stratejik sürprizleri önceden tahmin edememe gibi istihbarat başarısızlıkları, istihbaratın doğasında bulunmaktadır (Betts, 2008: 106). İstihbarat başarısızlıkları; analiste bağlı bilişsel hatalar, noktaları birleştirememe, bilgi eksikliği veya karar alıcıya bağlı hatalar gibi somut bir biçimde tanımlanmakta; genellikle istihbaratın öngörüler bağlamında sınırlı yapısı görmezden gelinmektedir. Geçmiş ve güncel verilerin çok detaylı bir biçimde toplanması, doğru tekniklerle analiz edilmesi sonucu doğru öngörülerde bulunulabileceği ve bu hataların indirgenebileceği varsayılır. Ancak, geleceğin her zaman, geçmişten itibaren neden-sonuç ilişkisine bağlı olarak doğrusal bir yön izleyeceği garanti değildir. Dolayısıyla istihbarat analizi, sağlam nicel ve nitel araştırma yöntemleri ile bilimsel yöntemlerle ortaya konup test edilmiş hipotezlere dayanarak karar alıcıya çözümler ve seçenekler sunuyor olsa da, bu tür sonuçlar mutlak değildir ve istihbarat bulgularında her zaman bir miktar olasılık ve belirsizlik bulunur (Prunckun, 2010: 2). Diğer bir ifade ile istihbarat analizi sınırlıdır; zira analiz üst düzey teknikler ile iyi yetiştirilmiş yetkin bir personel tarafından yapılsa dahi, yüzde yüzlük bir tahmin nadiren mümkündür. Dünya siyasetini ilgilendiren konularda araştırmanın ve erişimin ötesinde her zaman ölçülemeyen parametre ve etmenler mevcuttur (Mathams, 1995: 82). Geleceğin belirsiz ve sınırlı öngörü yapısı deneyimlenmiş olmasına karşın, geçmiş ve günümüz verilerinin detaylı bir biçimde toplanıp nedensellik bağlamında incelenmesi ve doğru tekniklerle analiz edilmesi sonucu belirsizliğin azaltılabileceği varsayılır. Bu varsayımın esasını ise, Newton'un doğrusal tümevarımcı nedenselliğini açıklayan determinizm oluşturmaktadır.

Klasik bilimsel anlayışı, diğer ifade ile Newton mekaniğinin neden-sonuç ilişkili, doğrusal, tümevarımcı anlayışının özünü oluşturan determinizm, kısaca "bilimsel nedenselliğe dayalı öngörülebilirlik" olarak tanımlanabilir (Oestreicher, 2007).. Bu anlamda determinizm, her olayın, doğa yasalarının gerektirdiği şekilde önceki olaya ve koşula bağlı olarak şekillendiği fikridir (Hoefer, 2016). Determinizmde olaylar, önceden var olan nedenler tarafından belirlenmektedir (Britannica, 2022). Deterministik sistemde sistemin mevcut durumu, gelecekteki herhangi bir zamandaki tam durumunu tamamıyla belirler. Bu da, sistemle ilgi ihtiyaç duyulan tüm bilgilere sahip olunması durumunda, sistemin geleceğinin hatasız bir biçimde tahmin edebileceği anlamına gelir (Lorenz, 1969: 289). Determinizmin fikirsel olarak en uç noktasını, bir düşünce deneyi olan "Laplace'ın Şeytanı" oluşturur. Laplace'a göre evren, adeta bir saat gibi işlediğinden, tüm olaylar neden sonuç ilişkisi içerisinde devam etmektedir ve evrendeki en büyük yapılardan en küçük atomlara kadar evrenin her türlü formülüne sahip bir üstün zekâ için, diğer deyişle bu "şeytan" için evrende hiçbir belirsizlik olmaz ve gelecek, adeta geçmiş gibi gözleri önünde olur (Weinert, 2016: 65).

Determinizmin fen bilimlerindeki başarısı, Laplace'ın bu görüşü ortaya atmasında oldukça etkiliydi. Netice itibarıyla insanlar, dünyayı anlamlandırmak için bir çerçeve ararlar ve bilimsel paradigma bunu insanlara sunmaktadır (Mann, 1992: 54). Nitekim sanayi toplumu da mekanik dünya görüşü olan Newton'un bu doğrusal düşünce sistemi üzerinde gelişmiş, onun faydalarını kullanıp inşa edilmiş bir toplumdur. Dolayısıyla, toplumun ve bilimin temel düşünsel paradigmasını bu mekanik düşünce sistemi şekillendirmiştir (Mercan vd., 2013: 116). Diğer bilimlerde olduğu gibi sosyal bilimlerin her alanı, bu düşünsel paradigmadan oldukça etkilenmiş ve nihayetinde adeta genel bir dünya görüşü olarak ortaya çıkmıştır. Bilimsellik bağlamında kalmak isteyen her alan, Newton fiziğinin temel kavramlarına yönelmiş; bu düşünce yapısı hayal gücünü dahi ele geçirmiş ve doğal olarak stratejik düşünce de bundan oldukça etkilenmiştir (Mann, 1992: 55).

Stratejik düşünce de bu paradigmadan yola çıkarak, dünyayı deterministik ve doğrusal olarak kabul etmiş ve davranışlarını önceden bilinen bir mekanizma olarak tanımlamıştır (Wing, 1995: 74). Nitekim modern savaş teorisyenleri ve stratejlerin metinlerinde, bu tür mekanik bir dil ve tanımlamaya sıkça rastlanmaktadır (Beyerchen, 1997: 74). Temel ilkelerin keşfedilmesi halinde olayların seyrinin tahmin edilmesine dayalı öngörülebilirlik sağlayan bu mekanik dünya görüşü, sosyal bilimlere de öngörülebilirlik açısından güven verici bir vaat sunmuştur. Böylece, bilimsel bir alan olan stratejik istihbarat analizinin de temelini bu bilimsel paradigmanın oluşturduğunu söylemek mümkündür.

Her ne kadar determinizm bu denli bir başarı ortaya koymuşsa da, determinizmin her sorunun çözümünü bulamadığı fikri 1800'lerde gelişmeye başlamıştır. Örneğin "Üç Cisim Problemi" olarak bilinen problemde cisimler, determinizme uygun bir biçimde evrensel yasalara göre hareket ediyor olmalarına karşın, sisteme üçüncü bir cismin girişi ile denklem öngörülemez bir hal almaktadır. Bu dönemlerde determinizmde tahminlerin önündeki engel, ya gözlem eksikliği, ya bilgi eksikliği ya da doğa yasaları ile alakalı

keşiflerin eksikliği olarak düşünülmüştür. Bu nedenle de, başlarda bu tür çözümsüz durumlar "özel durumlar" olarak kabul edilmiştir (Stone, 1989: 123). Ancak Poincare, bu çözümsüzlüğün "sistemin içkin özelliği" olduğunu ve bunun bilgi eksikliğinden veya çözememe yeteneğinden değil, doğası gereği hiçbir zaman çözülemeyecek bir problem olduğunu ortaya koymuştur (Akt. Britannica, 2016). Bu, aslında Kaos'un ilk keşfini teşkil etmektedir.

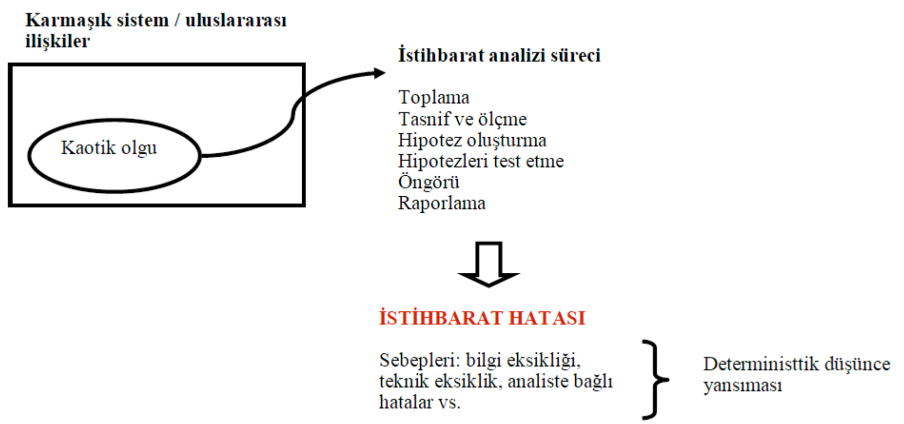
1927 yılına gelindiğinde Heisenberg, Kuantum mekaniğinde önemli bir yapı keşfetmiştir. "Belirsizlik İlkesi"ne göre, kuantum dünyasındaki belirsizlikler, sistemin içkin özelliğidir ve bilgi eksikliği veya ölçüm zafiyetinden kaynaklanmamaktadır. Böylece Heisenberg, aslında bilim dünyasına şunu vurgulamıştır; "bilebilmenin bir sınırı vardır." Böylelikle, Laplace'ın Şeytanı'nın idealize ettiği her anlamda öngörülebilir olan dünya düşüncesi yara almıştır ve bilim, artık sonlu bir tahmin ufkunu kabul etmiş bulunmaktadır (Hilgevoord, 2016). "Bilebilmenin sınırları" kuantum ile ortaya konulurken, aynı dönemlerde Kaos Teorisi bu iddiayı pekiştiren bir keşif olmuştur. Bir yandan determinizm, doğrusal dinamiklerin yapısını tanımlarken, öte yandan Kaos Teorisi, karmaşık sistemlerin bir alt dalı olarak, doğrusal olmayan dinamiklerin keşfini içermektedir. Diğer bir ifadeyle Kaos Teorisi, doğrusal olmayan ve öngörülemeyen sistemlerin var olduğunu öneren bir keşiftir (Bechtold, 1997: 193).

Determinizmdeki öngörülemezlik bilgi eksikliği ile açıklanırken, Kaos'taki öngörülemezlik bilgi eksikliğinden değil, sistemin içkin özelliği olmasından kaynaklanmaktadır (Lorenz, 1969: 305). Dolayısıyla Kaos Teorisi, öngörülebilir saat gibi işleyen bir evren anlayışından, öngörülemezliğin doğrusal olmayan sistemlerin doğasında bulunduğu anlayışını bilim dünyasına kabul ettirmiş olmuştur. Kaos'un bıraktığı bu etki, doğa bilimlerinde şüpheli yaklaşımları da beraberinde getirmiştir. Nitekim son zamanlarda fizikçiler bilimsel yöntemin o kadar da deterministik veya kesin olmadığını; matematikçiler ise, sayıların pek de nesnel olmadığı veya gerçeklere o kadar da dayalı olmayabileceğini savlamaktadırlar (Morçöl, 1996).

Doğa bilimlerinde Kaos Teorisi ile ortaya çıkan bu öngörülemezlik ve belirsizlik durumu, sosyal bilimcilerin de bu keşiflere olan ilgisini artırmıştır (Kiel & Elliott, 1996: 1). Bu anlamda Kaos Teorisi, sosyal bilimlerde tek yönlü ve determinist yöntemle çözülemeyecek karmaşık durumların açıklanmasında ve sosyal sistemlerin davranışlarındaki belirsiz ve öngörülemeyen yönlerin anlaşılmasında kullanılabilecek bir araç olarak ortaya çıkmıştır (Biçici, 2016: 33).

Karmaşık sistemler, diğer adıyla doğrusal olmayan sistemler, pek çok ilişki ağının bir arada olduğu, yoğun bir biçimde birbirine bağlı ve etkileşim halinde olan, parçalarının toplamının bütünü vermediği sistemlerdir (Casti, 2000). Küçük bir olayın zincirleme reaksiyon ile büyük felaketlere yol açabileceği devasa bir etkileşim ortamı olan uluslararası sistem, bu açıdan karmaşık sistemin mükemmel bir örneğidir (Mann, 1992: 60). Dolayısıyla Kaos Teorisi sayesinde; istihbarat analizinin doğasında bulunduğu kabul edilen belirsizlik ve öngörülemezliğin bilgi eksikliği, analiz veya ölçüm zafiyetinden ziyade, uluslararası ilişkilerin karmaşık yapısından kaynaklandığı, bu yüzden de karmaşık sistemlerin içkin özellik olarak her zaman öngörülemeyeceği fikri kabul edilmeye başlanmıştır. Sistemin neden öngörülemez olduğu ise, Kaos Teorisi'nin özellikleri ile bir sonraki bölümde açıklanarak detaylandırılacaktır.

Şekil 1: Kaotik Olguda İstihbarat Analizi Süreci ve İstihbarat Hatasının Yorumlanışı



Uluslararası ilişkiler karmaşık bir sistemdir ve karmaşık sistemlerin doğrusal hareket edeceğinin garantisi yoktur. Bu sebeple, geleceğin geçmişten itibaren doğrusal bir yön izleyeceği garanti değildir. Ancak, doğrusal düşünen analist, geçmiş ve bugünün bilgilerinin doğru bir biçimde toplanması ve doğru teknikler ile analiz edilmesi sonucu, sistemi öngörebileceğini varsayar ve bu doğrultuda öngörüde bulunur. Bu noktada, kaotik sisteme klasik öngörülerde bulunmaya çalışan analist, sistemin öngörülemeyen yapısından kaynaklı olarak istihbarat hatasına düşebilir ve öngörüleri doğru çıkmayabilir. Bu hatayı ise, bilgi eksikliği, teknik eksiklik gibi etmenlerden kaynaklanma varsayımına dayandırabilir (Bkz. Şekil-1). Ancak bu durum, aslında determinist düşünce tarzının bir yansımasıdır. Nitekim Gleick (2018: 43), bu duruma "kaos öncesi sezgi" adını vermektedir. Analistin incelediği olgu kaotik yapıda ve öngörü hatası da kaotik yapıdan kaynaklanıyor ise, artık bu hata Kaos ile açıklanabilir.

Kaos Teorisi, karmaşık yapılardaki kaotik hareketleri öngörememe durumunun, toplama ve analiz tekniklerinin geliştirilmesine indirgenemeyeceğini, zira bunun kaotik sistemlerin içkin özelliği olduğunu vurgular. Netice itibarıyla istihbaratın doğasında bulunan belirsizlik, uluslararası ilişkilerin kaotik sistemleri de bünyesinde bulundurmasından kaynaklıdır. Dolayısıyla, karmaşık bir sistem olan uluslararası ilişkilerde yapılan öngörüler, yalnızca doğrusal düşünce ile açıklanamayacaktır. Bu nedenle Kaos Teorisi, yeni bir muhakeme biçimi olarak karmaşık yapıda olan sosyal fenomenlere uygulanabilir. Bunu gerçekleştirebilmek için, teorinin özellikleri soyutlanarak, sosyal olgu üzerinde kaotik muhakemenin işletilmesi uygun olacaktır. Bu sayede istihbarat analisti, Kaos ile karşılaşması halinde ne yapması gerektiği ile ilgili bir anlayış geliştirmiş olmaktadır.

KAOTİK SİSTEMİN ÖZELLİKLERİ VE KAOTİK MUHAKEME

Bu bölümde Kaotik sistemin özellikleri; (1) Kelebek Etkisi ve (2) Düzen, olmak üzere iki başlıkta açıklanacaktır. Sonrasında Kaotik muhakeme süreci açıklanarak, Kaotik sistemin özellikleri soyutlanacak, diğer deyişle matematiksel bağlamından ayrılarak sosyal olguya kullanmak üzere özellikleri tecrit edilecek ve 1915 Çanakkale Deniz Savaşı örneği üzerinden Kaotik muhakeme süreci detayları ile işletilecektir.

Kaotik Sistemin Özellikleri

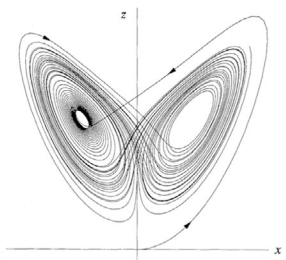
İnsanlık bilim,sel gelişmelerin büyük bir bölümünü determinizme borçlu olsa da, determinizmde her sorunun cevabı bulunmadığı ve doğa olaylarını tahmin etme konusunda yetersiz kaldığı fark edilmeye başlanmıştır. Örneğin atmosferdeki hareketlilik fizik kanunlarına uygun olsa da, hava durumunu tahmin etmek oldukça zordur (Heinz-Otto vd., 2004: 10). Nitekim

1961 kışında matematikçi ve meteorolog Edward Lorenz, hava durumu tahminleri için girdiği verilerdeki çok küçük değişikliklerin, geniş çapta önemli ve öngörülemez sonuçlara yol açtığını fark etmiştir (Gleick, 2018: 28-29). Değişkenler, grafikte karmaşık ve rastgele hareket ediyor gibi görünmektedir; ancak, hiçbir hareket kendini tekrar etmemekte, sistem belirli sınırlar içerisinde kalarak gözle görünür bir düzen oluşturmaktadır (Bkz. Şekil-2). Böylece Lorenz, düzensiz bir yapı içerisinde hassas bir düzenin gizlendiğini ortaya koymuştur (Gleick, 2018: 44). Lorenz'in bu keşfi, diğer deyişle doğrusal olmayan dinamiklerin keşfi, Kaos Teorisi'nin temellerini atmıştır (Kiel & Elliott, 1996: 1).

(1) Kelebek Etkisi

Determinizme göre, başlangıç koşulları bilindiği takdirde, sonraki durumların ne olacağı hesaplanabilir. Örneğin dünyaya doğru gelen bir göktaşının saat saat konumu, geliş yönü ve geçeceği yer, determinizm ile keşfedilen evrensel yasalara göre hesaplanabilir (Gleick, 2018: 28-29). Ancak, başlangıç koşullarını hesaplamak yüzde yüz mümkün değildir; diğer deyişle yalnızca çok küçük bir farkla yaklaşık değeri hesaplanabilir. Determinizmin gücü de buradadır; yani başlangıç koşullarına hassaslık yoktur ve göz ardı edebilecek derecede küçük hata payları, sonuçları önemli derecede etkilemez (Karaçay, 2004: 5). Ancak, Kaos Teorisi'nde alanyazına "Kelebek Etkisi" olarak geçen başlangıç koşullarına hassas bağımlılık, kaotik yapılarda sistemin davranışlarını tahmin edilemez yerlere götürmektedir. Nitekim "Çin'de bir kelebek kanat çırparsa Teksas'ta kasırga olabilir" deyişi, bu durumu en iyi biçimde betimleyen popüler söylem olmuştur (Karaçay, 2004: 6).

Şekil 2: Lorenz Çekicisi



Kaynak: Strogatz, S. H. (1994).

Kaos Teorisi'ndeki sınırlı öngörüsel yapı, başlangıç koşullarına hassas bağımlılıktan kaynaklanır. Başlangıç koşullarındaki çok küçük bir fark, sistemi beklenmeyen bir yere götürür; dolayısıyla, sistemde uzun vadeli öngörülerde bulunulamaz. Lorenz'in bu keşfi, belli bir noktadan ötesinin asla tahmin edilemeyeceği üzerinedir. Bu ise, sistemin içsel özelliğinden kaynaklı sonlu bir tahmin ufku demektir (Lorenz, 1969: 305). Böylece, uzun vadeli hava tahminlerinin başarısızlığa mahkûm olduğunu ortaya koymuş olan Lorenz, bu durum için şu ifadeyi kullanmıştır; "*...bunu yapmayı zaten başaramayacağımız açıktı ama artık bir bahanemiz vardı.*" (Akt. Gleick, 2018: 30). Dolayısıyla, Kelebek Etkisi'nin özelliklerini kısaca şu şekilde betimlemek mümkündür: (a) Başlangıç koşullarına hassas bağımlılık; (b) Sınırlı bir tahmin ufku (uzun vadeli öngörülere şüpheli bakış).

(2) Düzen

Lorenz'in Kaos'taki ikinci keşfi, sistemin oluşturduğu 'düzen' olmuştur. Lorenz'e göre, sistem rastgele hareket etmemekte; hiçbir hareket kendini tekrar etmemekte; ancak, sonunda sistem, beklenmedik şekilde bir düzen deseni oluşturmaktadır (Bkz. Şekil-2). Bu kısıtlı yapının sınırları olan (a) sistemin tüm olası durumları, (b) oluşan desen ve (c) bu desenin dışına çıkmaması durumları, "faz uzayı" olarak adlandırılır (Gleick, 2018: 68). Bu düzen, karmaşıklığın içinde öngörülemeyen; ancak, dalgalanmalar ve türbülanslar sonucu dışarıdan müdahale olmadan kendi kendini organize eden bir yapıdır (Mann, 1992: 62). Bununla birlikte düzenin varlığı, kaotik sistem için oldukça önemlidir; zira bu, düzen kalıpları sayesinde sistemin bir dereceye kadar tahmin edilebileceğini göstermektedir (Mann, 1992: 58). Sistemin rastgele değil, düzensiz hareket edişi, belli bir tahmin ufku çizer. Kaos'ta kısa vadeli tahminlerin önünü açan şey de budur. Bu, sistemin kendi kendini tekrar etmemesi; ancak, benzer olan tekrar kalıpları içermesinden ötürü mümkündür (Glenn, 1996: 68).

Sistemdeki sarmalların yoğunlaştığı bölümlere "çekici" adı verilir. Çekiciler, sistemin davranışlarını sınırlayarak sistemdeki yörüngeleri kendine doğru çeker (Bkz. Şekil-2). Çekici üzerindeki bu yörünge yoğunluğu, sistemin davranışı hakkında fikir vermektedir. Bunlar, rastgele olduğu sanılan davranışa bir yapı kazandırır. Bir sistemin çekicilerine ilişkin bilgi, sistem davranışındaki uzun vadeli eğilimler hakkında pratik bilgiler sunar (Glenn, 1996: 57). Bu salınımlar rastlantısal olmayan bir düzenlilik deseni meydana getirir. Bu örüntülerin her biri bir öncekiyle asla kesişmez; ancak, benzerlik gösterebilir. Sistemin daha küçük bir bölümü, daha büyüğüne benzeyebilir (Smith, 1995: 22).

Doğrusal sistemler parçalara ayrılıp çözümlenebilir. Zira tüm parçaların toplamı bütünü, diğer deyişle sistemin kendisini verecektir. Ancak, kaotik sistem parçalara ayrılamaz; dolayısıyla, analitik olarak çözümlenmesi mümkün değildir (Strogatz, 1994: 8-9). Karmaşık sistemlerde bütün, parçalarının toplamından fazlasıdır (Gell-Man, 1997: 8). Bu bağlamda, Kaos'taki "düzen" durumunun özelliklerini kısaca şu şekilde betimlemek mümkündür:

- Sistem sonunda düzene kavuşur,
- Kapalı sistemler kendi kendini organize eder,
- Tekrar kalıpları kısa vadeli tahminleri mümkün kılar,
- Sistemin küçük bölümü, ulaşılacak düzen hakkında fikir verebilir,
- Bütün, parçaların toplamından fazlasıdır.

Kaotik Muhakeme Süreci

Evren, en büyük kapalı karmaşık sistem olup, doğrusal ve kaotik hareketleri bir arada barındırır. Uluslararası sistem ise, sosyal bilimlerde en büyük kapalı karmaşık sistemdir. Uluslararası arena, diğer deyişle uluslararası sistem incelendiğinde, başlangıç koşullarına duyarlı, karmaşık ilişkiler ağının olduğu çok aktörlü bir hareket alanı olduğu görülür. Ancak tıpkı evrendeki gibi, uluslararası ilişkilerde de mikro ve makro ölçekte doğrusal ve doğrusal olmayan ilişkilerin varlığı yüksek olasılıklıdır. Dolayısıyla, uluslararası ilişkilere ilişkin olarak, onun her zaman doğrusal olmayacağı gibi, her daim kaotik olacağı varsayımında da bulunulamaz (Glenn, 1996: 40). Zira karmaşık sistemlerin hepsinin kaotik hareket edeceği söylenemez (Flores, 2017: 15). Dolayısıyla analistin, incelediği sistemin kaotik olup olmadığını tespit etmesi gerekmektedir. Bunun için en önemli nokta, Kelebek Etkisidir. Bir sistem başlangıç koşullarına hassas bağımlı ise, kaos bulmak garanti değildir; ancak, başlangıç koşullarına bağımlı değil ise, "kaos" sergilemesi çok düşük bir olasılıktır (Glenn, 1996: 32). Eğer analistin incelediği sistem doğrusal hareket ediyorsa, neden-sonuç ilişkili doğrusal öngörüleri doğru çıkabilir. Ancak sistem kaotik hareket ediyorsa, analistin bu tip bir akıl yürütme tarzı, öngörülerde bulunmak adına yeterli olmayabilecektir (Saperstein, 1997: 48). Bu bağlamda, kaotik sistem ile deterministik sistemin özelliklerinin mukayesesi, en basit haliyle Tablo-1'de verilmiştir.

Tablo 1: Kaotik Sistem ile Deterministik Sistemin Özelliklerinin Karşılaştırması

KAOTİK SİSTEM	DETERMİNİSTTİK SİSTEM
1. Başlangıç koşullarına hassas bağımlılık • Sistemin mevcut durumu, sonraki durumu hakkında bilgi vermez ↓ Uzun vadeli öngörülerde bulunulamaz / sonlu tahmin ufku	**1. Başlangıç koşullarındaki hata payları önemsiz** Sistemin mevcut durumu, gelecekteki herhangi bir zamandaki tam durumunu tamamen belirler. ↓ Uzun vadeli öngörüler doğru çıkar / sınırsız tahmin ufku varsayımı
2. Düzen • Düzen, kendisini tekrar etmeyen ancak benzer olan tekrar kalıpları barındırır ↓ Kısa vadeli tahminler mümkün Tekrar kalıpları uzun vadeli eğilimler hakkında fikir verebilir/ ulaşılabilecek düzen hakkında fikir verebilir • Doğrusal hareket etmez ancak rastgele değildir ↓ Rastgele olmadığı için düzene sahiptir/ sistem düzene ulaşır • Bütün, parçaların toplamından fazlasıdır ↓ Tümevarım yapılamaz	**2. Doğrusal** Olaylar önceden var olan nedenlere tarafından belirlenir/ nedensellik ↓ Parçaların toplamı bütünü verir / tümevarım yapılır

Kaynak: Yazarlar tarafından hazırlanmıştır.

İncelenen sistemin kaotik olup olmadığının tespit edilmesi sonrasında Kaos Teorisi'nin Tablo-1'de soyutlanmış olan özellikleri sistem üzerine uygulanarak kaotik muhakeme süreci işletilmelidir. Bu noktada, Kaotik muhakeme ile Kaos öncesi öngörü, örnek bir olay olarak 1915 Çanakkale Deniz Savaşı örneği ile karşılaştırılıp somutlaştırılacaktır.

1915 Çanakkale Deniz Savaşı'nda İngiltere önderliğindeki Müttefik kuvvetleri, nitelik ve nicelik olarak Osmanlı Devleti kuvvetlerinden üstün olmaları sebebiyle, önemli bir mukavemet görmeden savaşı nihayete erdireceklerini düşünmüşlerdir (Hudoğlu, 2020). Bu durum, Kaos öncesi öngörünün yansımasıdır ve Tablo-2'de gösterilmiştir.

Tablo 2: Kaos Öncesi (Deterministik) Öngörü

DETERMİNİSTTİK SİSTEM	DETERMİNİSTTİK (KAOS ÖNCESİ) ÖNGÖRÜ
1. Başlangıç koşullarındaki hata payları önemsiz Sistemin mevcut durumu, gelecekteki herhangi bir zamandaki tam durumunu tamamen belirler.	Müttefik donanmaların nitel ve nicel üstünlüğü, savaşta doğrusal bir sonuç oluşturarak, savaşı kazandıracak öngörüsü.
Uzun vadeli öngörüler doğru çıkar / sınırsız tahmin ufku varsayımı	Nedensellik bağlamında yapılmış olan bu öngörü, doğru çıkacaktır varsayımı.
2. Doğrusal Olaylar önceden var olan nedenlere tarafından belirlenir/ nedensellik	Savaşın sonucunu belirleyen şey, savaş öncesi iki aktörün durumları. Güçlü olan zayıf olanı yener; Müttefik gemileri güçlü, Osmanlı müdafaası zayıf= Müttefikler Osmanlı ordusunu yener.
Parçaların toplamı bütünü verir / tümevarım yapılır	Savaş elemanlarının tek tek incelenmesi, savaş sonucu hakkında bilgi verir. Savaş durumu, elemanların toplamıdır.

Kaynak: Yazarlar tarafından hazırlanmıştır.

Ancak, sonuç beklenen gibi olmamış ve Müttefik kuvvetleri 1915 Çanakkale Deniz Savaşı'nı kaybetmiştir. Bu olayda Müttefikler tarafından deterministik bir öngörü yapılmış; bununla birlikte, kaotik bir sonuç alınmıştır. Dolayısıyla, Müttefiklerin öngörüleri hatalı çıkmıştır; zira bu savaşın kaybedilmesindeki en önemli etken, Nusret mayın gemisinin Karanlık Limana döşediği deniz mayınlarıdır. Keza Nusret mayın gemisinin döşediği mayınların savaşın gidişatına olan büyük etkisine değin görünüm Müttefik donanmaları lehinde vuku bulmaktadır. Ancak, Türk mayınlarına çarpan ve batan/savaş dışı kalan dört Müttefik zırhlısından sonra Müttefik deniz kuvvetleri Boğaz'dan çekilmek zorunda kalmıştır. Dolayısıyla, 1915 Çanakkale Deniz Savaşı'nda Nusret mayın gemisi bir kelebek etkisi oluşturmuş; bu nedenle, Müttefiklerin doğrusal akıl yürütmesi başarılı olmamıştır.

Bu meyanda, kaotik muhakemenin öngörü açısından kaotik meselede daha başarılı sonuçlar verebileceğini savlamak mümkündür. Bu argümanı test

etmek üzere, Tablo-3'te soyutlanmış olan Kaotik sistemin özellikleri ile 1915 Çanakkale Deniz Savaşı üzerine Kaotik muhakeme süreci işletilmiştir.

Tablo 3: Kaotik Sistemin Özelliklerinin Soyutlanıp 1915 Çanakkale Deniz Savaşı Üzerine Kaotik Muhakeme Sürecinin İşletilmesi

KAOTİK SİSTEM	ÇANAKKALE SAVAŞI
1. Başlangıç koşullarına hassas bağımlılık • Sistemin mevcut durumu, sonraki durumu hakkında bilgi vermez	Nitelik ve niceliksel üstünlük, doğrusal bir sonuç vermeyebilir. Sistemin mevcut durumu, Müttefiklerin Osmanlı'dan güçlü olması, savaşın kazanılacağı bilgisine ulaştırmaz.
Uzun vadeli öngörülerde bulunulamaz / sonlu tahmin ufku	Savaşın kazanmakla sonuçlanacağı yorumu yapılamaz/ savaş esansınsa Müttefiklerin öne geçeceği durumlar olabilir. Bu durumlar savaş için nihai sonucu vermez.
2. Düzen • Düzen, kendisini tekrar etmeyen ancak benzer olan tekrar kalıpları barındırır	Sırasıyla Bouvet, Irresistable, Inflexible ve Ocean gemilerinin Nusret'in mayınlarına çarpıp batması/ savaş dışı kalması.
Kısa vadeli tahminler mümkün Tekrar kalıpları uzun vadeli eğilimler hakkında fikir verebilir/ ulaşılabilecek düzen hakkında fikir verebilir	İlk gemilerin çarpmasından sonra, diğer gemilerin de çarpacağı öngörülebilir. Gemilerin çarpmasıyla başlayan mağlubiyet görüntüsü, savaşın sonucu olabilir.
• Doğrusal hareket etmez ancak rastgele değildir	Gemilerin batması tekrar kalıbı oluşturuyor. Güçlü gemiler doğrusal sonuç alamıyor– zayıfı yenemiyor. Yenilgi rastgele değil– Nusret mayın gemisinin taktiksel hamlesi kelebek etkisine dönüşmekte.
Rastgele olmadığı için düzene sahiptir/ sistem düzene ulaşır	Gemiler çarpmaya devam ederse, savaşı Müttefikler kaybedebilir. Yeni düzen, Nusret'in oluşturduğu kelebek etkisi ile başlayan zafer görüntüsü olabilir.
• Bütün, parçaların toplamından fazlasıdır	Savaş elemanlarının tek tek incelenmesi, savaş sonucu hakkında bilgi vermez. Savaş durumu, elemanlarından fazlasıdır.
Tümevarım yapılamaz	

Kaynak: Yazarlar tarafından hazırlanmıştır.

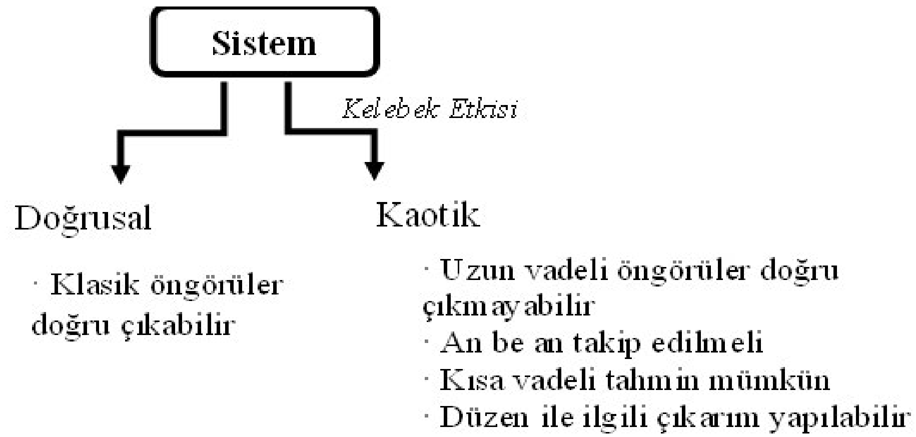
Sistemde tekrar kalıbı oluşturduğundan, bu sistemin çekicileri gemilerdir. Gemilerin batması ile deniz savaşının kaybedilmesi arasındaki ilişkisellik bağı sebebiyle düşünsel süreç bu olgular üzerine inşa edilmiştir. Her olayda bir neden-sonuç ilişkisi vardır; ancak, buradaki önemli nokta, neden ile sonuç arasındaki ilişkinin doğrusal olmaması, nedenlerin sonucu doğurabileceğini öngörememe durumudur. Deterministik düşünceye göre, küçük bir mayın gemisi tüm savaşın kaderini değiştiremez. Keza buna göre, görece daha küçük ve etkisiz değişkenlerin daha küçük ve etkisiz sonuçlara yol açması gerekir. Ancak Kaos teorisi, görece küçük etkilerin sistemi öngörülemez boyutlarda değiştirebileceğine vurgu yapar. Nitekim 1915 Çanakkale Deniz Savaşı sonunda elde edilen zafer, bunun en önemli örneklerinden biridir.

Zira savaş olgusu, mikro bir karmaşık sistemdir. Dolayısıyla savaş hali, düzensiz bir hal olduğundan (Glenn, 1996: 60), savaş hali öncesinde yapılan düşman imkân ve kabiliyetleri, kendi hareket tarzlarımız gibi tahminler ile kâğıt üzerinde yapılan nicel ve nitel güç mukayeseleri, savaşın sonucu ile ilgili sağlıklı bir bilgi vermeyecektir. Savaş başladıktan sonra muharebe ortamı giderek kaotikleşebileceğinden, doğası gereği muhabere ortamının belirsizliği artacak ve bir noktadan sonra muharebenin gidişatı üzerine öngörüde bulunmak oldukça zorlaşacaktır. Kâğıt üzerindeki kuvvet durumları, bu gücün kullanılacağı dönemde sistemin içkin özelliklerinden ötürü öngörülebilirlik açısından bir fayda sağlamayabilecektir. Ancak, yine belirsizliği azaltmak adına doğrusal düşünme ile tahminler yapılmak zorundadır. Yukarıda da bahsedildiği üzere, her karmaşık sistemin kaotik hareket edeceği garanti değildir. Bununla beraber, sistemin kaotikleşmesi için doğrusal tahminlerin artık geçerli olmayacağı bir kelebek etkisinin olması gerekmektedir. Böyle bir "an"ın olması, savaşın sonucunu doğrudan etkileyebilir ve doğrusal öngörüler geçerliliğini yitirebilir. Ancak, gidişatta beklenen dışında bir gelişme yaşanmıyorsa, doğrusal bir sonuç alınabilir. Nihayetinde savaşı kimin kazanacağı cevabı, bu sebeplerden ötürü savaş öncesinde öngörülemez. Bu sorunun cevabı, doğası gereği uzun vadede öngörülemezdir. Dolayısıyla, savaş durumuna benzer mikro ve makro sistemler için de benzer yorumlar yapılabilir.

Geçmişte yaşanmış bir olayın kaotik olup olmadığını tespit etmek daha kolay olabilir. Bu noktada şu soru akla gelmektedir: Güncel olayların kaotik olup olmadığı veya kaotikleşmeye başladığı nasıl anlaşılabilir? Analist, takip ettiği sistemin kaotik olup olmadığını bilmeyerek, belirsizliği azaltmak adına yine klasik öngörülerde bulunmak zorundadır. Sistemin kaotik olup olmadığını tespit etmenin yolu, olayın gidişatını incelemekte yatar. Bu meyanda Kelebek Etkisi, sistemdeki en önemli belirleyicidir. Dolayısıyla, analistin böyle bir nokta yakalaması gerekir. Genellikle böyle durumlar günlük hayatta "kırılma anı", "kartopu etkisi" vb. olarak adlandırılır. Bunlar, önemsiz görünen; ancak, gidişatı etkileyen, sürpriz etkileri olan gelişmelerdir.

Bunun için analist, küçük parametreleri incelemelidir ve küçük parametrelerin büyük değişikliklere yol açabileceğini göz önünde bulundurmalıdır. Eğer böyle bir nokta yakalarsa, bu sistemin artık kaotik bir hareket sergileyebileceğini, uzun vadede öngörülemez olabilme ihtimalinin olduğunu kabul etmelidir. Ancak, yine de birçok kez vurgulandığı üzere, başlangıç koşullarına hassas bağımlı olması, sistemin kaotik hareket edeceğinin garantisi değildir. Bu sebeple, sistemin nereye evirileceğini anlamak üzere, deyiş yerindeyse "an be an" takip edilmesi gereklidir ki, bu meyanda hazırlanan basit bir diyagram Şekil-3'te sunulmuştur.

Şekil 3: Sistemin Öngörü Süreci



Kaynak: Yazarlar tarafından hazırlanmıştır.

İncelenen sistem doğrusalsa, klasik yöntemler ile yapılan öngörüler doğru çıkabilir. Sistem kaotik ise, sistemde uzun vadeli stratejik öngörüler aldatıcı olabilir (Mann, 1992: 62). Kelebek etkisinin tespitinden sonra, önceden yapılmış doğrusal öngörüler geçerliliğini yitirmiş olabilir. Bu noktadan sonra kaotik sistemin özelliklerinin soyutlanıp kaotik muhakeme işletilmelidir. Süreç, sistemi kendi içerisinde an be an takip etmek, buradaki tekrar kalıplarının keşfi ile kısa vadeli öngörüler çıkarmak ve bu kalıplar yardımı ile burada oluşacak düzen ile ilgili bir çıkarımda bulunmak, şeklinde devam etmelidir. Kaotik sistemin özelliklerinin soyutlanıp sisteme uygulanması ile ilgili örnek Tablo-3'te verilmiştir. Kaos Teorisi düzenin "ne zaman" oluşacağına dair bir şey söylemezken, sistemin zatî özellikleri nasıl bir düzen oluşacağına dair ipuçları verebilmektedir.

KAOS TEORİSİ'NİN İSTİHBARAT ANALİZİ İÇİN ÖNEMİ

Wing'e göre (1995: 23); "*Tarih, olayların beklenen seyrine uymadıkları için göstergelerin göz ardı edildiği istihbarat başarısızlıkları örnekleriyle doludur*". Dolayısıyla, kaotik düşünme yeteneğine sahip analist, kaos ile karşılaştığında onu sezebilir; beklenmedik gelişmelere karşı olumludur ve küçük bir olayın yavaş yavaş büyümesini göz önünde bulundurur ve ilk izleniminde ısrarcı olmaz. Analist, analizindeki hatanın kendisinden kaynaklı değil, sistemin öngörülemez içkin özelliğinden kaynaklı olduğunu bilir ve değişimi kabul etmesi kolaylaşır. Bu sayede analist, beklenmedik bir olaya karşı açık görüşlü olur ve stratejik sürprizleri indirgeyebilir.

İstihbarat analistleri, analizlerinde parçaları bir araya getirip bir resim oluşturmaktan ziyade, önce resmi oluşturup sonra ona uygun parçaları bulmaya çalışır (Heuer, 1999: 62). Dolayısıyla, analist için önemli olan "resmi" görebilmektir. Kaos'un en kritik noktalarından biri bir desen oluşturma, diğer deyişle görselleştirilmesi, belli bir faz uzayı içerisinde olan ve düzen arz eden bir "model" ortaya çıkarma durumudur. İstihbarat analisti elindeki karmaşık verilerden benzer bir resme ulaşmaya çalışır. Bilimsel metodolojilerin yanında, sezgi unsuru istihbarat analizi için önemli bir unsurdur; ancak, sezgi tecrübe ve anlayışla bağlantılıdır. Örneğin bir satranç oyununda oyunu oynamanın kurallarını bilmek, başarılı oyun stratejileri hakkında bir fikir vermez. Bu stratejiler, yalnızca satranç tahtasındaki etkileşimlerin karmaşıklığını deneyimledikten sonra öğrenilebilir (Levy, 1994: 172). İstihbarat analisti dünyanın işleyişine yönelik anlayışını geliştirdiği ölçüde, sezgi noktasında da düşünme tarzını şekillendirecek yeni zihinsel modellere sahip olacaktır. Böylelikle olguya ait 'desen'i sezebilecek, bu desenler yardımıyla anlamlandırma faaliyeti kolaylaşacak ve ihtiyacı olan resmi ortaya koyabilecektir. Zira Kaos Teorisi'nin kabulü ve kullanımı bir öncekini reddediş veya bilimsel bir tartışma içine girmek değildir. Zira Kaos Teorisi, klasik fizik ve matematik paradigması ile çelişmez. Teori, doğrusal ve öngörülebilir bir evren anlayışına karşın, doğrusal olmayan ve öngörülemeyen sistemlerin de var olduğunu açıklar. Kısacası teori, evrendeki başka bir durumun açıklamasını yapmaktadır.

İnsanoğlu her ne kadar bilinç sahibi bir varlık olsa da, sonuçta dünyaya ve evrene aittir; bu nedenle, onun evrenin işleyişinden muaf olduğunu düşünmek anlamsız olacaktır. Dolayısıyla hem determinizm hem de kaos olgusunun, dünyanın bir parçası olan insanın davranışları ve gerçekleşen sosyal fenomenleri için de geçerli olduğu söylenebilir. Nitekim Mann'in (1992: 59) aktardığı şekilde, 1972 yılında J. David Singer ve arkadaşları, 150 yıllık bir dönemi incelendikleri araştırmalarında 20 yıl arayla küresel şiddetin zirvelerinde bir düzenlilik olduğunu ve bu durumun güçlü bir dönemsellik arz ettiğini, hatta başlangıçlarının Nisan ve Ekim ayında olduğunu temel araştırma bulguları olarak ortaya koymuşlardır (Ayrıntı için bkz. Singer ve Small, 1972: 214-216). Yine Mann'e (1992: 59) göre, Modelski'nin "hegemonik döngüler"i (Akt. Flint & Taylor, 2014: 50-59) ve Kondratieff'in "ekonomik döngüler"i (Akt. Flint & Taylor, 2014: 21-27), Kaos Teorisi ile açıklanabilir. Bunun yanında, iktisat ve ekonomi alanlarında kaotik yapıların tekrar kalıbı içeren davranışları açısından önemli bir alanyazın oluşmaya başlamış olup, söz konusu incelemeler, kısa vadeli tahminleri mümkün kılabilmek üzerine yapılmaktadır.

Kaosu keşfetmek veya karmaşıklık teorilerini anlamak için bilgisayar simülasyonlarına ihtiyaç yoktur. Ekonomik, sosyal veya siyasal ilişkilerin sadece doğrusal hareket etmediği, tek başına gözlemlenerek dahi anlaşılabilir. Bu sebeple, bu tip ilişkileri sadece doğrusalmış gibi düşünüp, yalnızca bu tip öngörülerde bulunmada ısrar etmek hatalara kapı aralayacaktır (Rosenau, 1997: 39). Kaos, belki çok net bir yol haritası sunmayacak; ancak, sistemlerin ayırt edilmesine yönelik bir bakış açısı ve dünya düzenindeki kaotik yapıların tespiti ile ilgili bir kabul sağlayacaktır. Bu meyanda, analitik durgunluktan çıkılabilmesi adına, stratejik düşünce tarzının değiştirilmesi gerekmektedir (Mann, 1997: 58).

Newton fiziğinin bir asır önce bilimsel yöntemi, sosyal bilimleri ve diğer olguları açıkça etkilemesi gibi, Kaos Teorisi de yeni bilimsel yöntemleri açıkça etkileyecektir (Biçici, 2016: 491). Klasik paradigmanın bilimsel yöntemlerinden faydalanarak davranış açıklaması yapmaya çalışan sosyal bilimler, yeni bilimler ve Kaos Teorisi'ni takip etmeli ve bundan faydalanmalıdır. Dolayısıyla, belirsizlik ortamında bir anlama ve anlamlandırma faaliyetinde bulunan istihbarat analistinin yeni gelişmeleri takip etmesi, düşünce yapısını bu yönde şekillendirmesi uygun olacaktır. İstihbaratın bir alt disiplini olan stratejik istihbarat analizi de, sosyal bilimlerin kaosa karşı ilgisinden üzerine düşeni alarak, bu doğrultuda akıl yürütmesini geliştirmelidir. Bu sayede, Kaos ile yüz yüze gelindiği durumlarda, kaotik düşünme yeteneğine sahip bir analist kaosu fark edebilir; kendi alanında, organizasyonunda, deneyimlerinde ve karar vermede kaosun yaratıcı düşüncesinden yararlanabilir (Glenn, 1996: 6).

Bilindiği üzere, klasik eğitimden geçmiş pek çok insanın sezgisi doğrusaldır ve bu karmaşık dünyada tek başına fayda sağlamayabilir. Kaos Teorisi açısından analist için bu aşamada yapılacak ilk şey, kaotik sezginin geliştirilmesi olmalıdır. Zihnin tek yönlü beslenmesi, beslenmediği noktalardan mutlaka kelebek etkisine sebep olacak, başlangıçta fark göze çarpmasa da uzun vadeli öngörülerde sonuçlar bambaşka noktalara gidecektir. Analist, farklı alanlarda düşüncesini geliştirdiği takdirde zihni aydınlanır, olaylara farklı açılardan bakabilir ve bu da farklı bağlantılar kurmasını kolaylaştırır. Yalnızca bunun için bile yeni bilimleri takip etmeli ve bakış açısını geliştirmelidir. İstihbarat analisti için her ne kadar doğru tahmine yüzde yüz oranında ulaşmak imkânsız gibi görünse de, Einstein'ın ifade ettiği gibi "Hiçbir sorun, onu yaratan aynı bilinçle çözülmez". Eski dünyanın sorunları ve çözümleri, eski dünyanın düşünme şekli ile çözülecektir; dolayısıyla, yeni dünyanın sorunlarını çözmek için analist kendi bilincini bilinçli bir şekilde –yeniden ve yenileyerek- geliştirmek zorundadır (Overmann, 1996: 490).

SONUÇ

Bu çalışmada, ilk olarak istihbaratın doğasında bulunan belirsizlik ve öngörülebilirliğin doğası, Kaos Teorisi üzerinden bilimsel bir zemine oturtulmaya çalışılmıştır. İkinci olarak, Kaotik sistemin özellikleri soyutlanmış ve kaotik muhakeme, 1915 Çanakkale Deniz Savaşı örneği üzerinden somut bir biçimde işlenmiştir. Böylelikle, stratejik istihbarat analizi ve analisti için Kaotik sistemleri öngörmede yeni bir muhakeme denemesi olarak ortaya konmaya çalışılmıştır. Nitekim benimsenen bu nitel-analitik araştırma metodolojisi yaklaşımı, çalışmanın temel amacı olan Kaos teorisinin istihbarat analizinde kullanımı ile ilgili bir tartışma başlatmak ve böylece ilgili alanyazına bir başlangıç mehazı teşkil etmek ile uyumludur. Bu bağlamda, çalışmanın birinci araştırma hipotezine binaen istihbaratın doğasında bulunan belirsizlik Kaos Teorisi ile açıklanmıştır. Buna göre, bilimsel yöntemlerle çalışan ve sosyal bilimlerin bir alt dalı olarak kabul edilen istihbarat analizinin, bundan böyle determinizmin "öngörülebilir

evren" düşüncesini, Kaos'un öngörülebilirliğin sınırlı olduğu anlayışı ile geliştirmeye başlayabileceği savlanmıştır.

Bunda temel itki, stratejik istihbarat analizinin çalışma alanı olan uluslararası ilişkiler disiplininin özünde en büyük karmaşık, kaotik sistemlerden birisi olduğu gerçeği olmuştur. Nitekim kaostaki belirsizlik, sistemin içkin özelliğidir ve bilgi eksikliğinden kaynaklanmamaktadır. Bu durum, doğrusal olmayan dinamiklerin doğasıyla ilgilidir. Karmaşık sistemler, doğrusal veya kaotik hareket edebilir. Dolayısıyla, doğrusal düşünme tarzı tek başına, karmaşık sistemleri açıklamada ve öngörmede yeterli olmayacaktır. Zira kaotik sistemlerin doğrusal hareket edeceğinin garantisi yoktur. Eğer incelenen sistem doğrusal hareket ediyorsa, doğrusal tahminler doğru çıkabilir. Ancak, istihbarat analistinin incelediği sistem kaotik ise, bunu doğrusal düşünme ile öngörmesi oldukça zordur, dolayısıyla doğrusal öngörülerde ısrar halinde istihbarat hatasına düşülmesi olasıdır. Kaotik düşünen bir analistin, başlangıçtaki öngörülemezliğin kendi zafiyeti değil, karmaşık sistemin içkin özelliği olduğunu bilmesi halinde değişimleri kabul etmesi kolaylaşacaktır.

Bununla birlikte analist, takip ettiği sistemin kaotik olup olmadığını "kelebek etkisi" ile anlayabilir. Sistemde kelebek etkisinin tespitinden itibaren öncesinde yapılmış doğrusal tahminlerin artık sistem ile ilgili bir çıkarım yapmada yeterli olmayacağı, kaotik sistemin öncesinde öngörülebilirliğinin oldukça düşük olduğu yorumu yapılabilir. Nitekim bu çalışmanın ikinci araştırma hipotezine de, bu noktadan sonra kaotik sistemin özelliklerinin soyutlanıp incelenen olgu üzerine kaotik muhakemenin işletilmesi halinde sistem hakkında bir dizi çıkarım yapılabileceği hususunu bir başka tespit olarak ortaya koyarak, desteklemektedir. Dolayısıyla, sistemin an be an takip edilmesi koşulu ile tekrar kalıpları üzerinden kısa vadeli tahminlerde bulunulabileceği bir başka tespittir. Böylece analist, sistemin içsel özelliklerini inceleyip, sistemin faz uzayı ve döngüleri hakkında fikir sahibi olabilir; bu durum da, belli bir öngörülebilirlik ufkunun çizilmesi manasına gelir.

Zira unutulmamalıdır ki, ilk aşamada Kaos teorisinin önemi aslında analist için öncelikle bir "kaotik sezgi" oluşturmaktır. Böylelikle analist, Kaos ile karşılaştığında onu tanır ve bu noktadan sonra ne yapması gerektiği ile ilgili bir anlayış geliştirebilir. Bunun için Kaos Teorisi ve özelliklerini bilinmeli ve kaotik sezgi geliştirilmelidir.

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The Impact of Online Reviews on Consumer Restaurant and Hotel Selection Decisions in Türkiye[1]

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ABSTRACT

The study is set to assess the impact of online reviews on consumer restaurant and hotel selection decisions in Türkiye. The hypothesis was that there is a positive the effect of recentness of website reviews on consumer restaurant and hotel selection decisions in Türkiye. There is a positive effect of characteristics of reviews on consumer restaurant and hotel selection decisions in Türkiye. There is a positive effect of the usefulness of the review on consumer restaurant and hotel selection decisions in Türkiye. There is a positive effect of reliability on consumer restaurant and hotel selection decisions in Türkiye. There is a positive effect of popularity of websites on consumer restaurant and hotel selection decisions in turkey. The data was collected using questionnaires from 399 respondents from the selected online restaurants that included staff and customers of the restaurants and hotels. The data collected was analyzed based on descriptive statistics and regression analysis. The study results indicate that there was a positive effect of online reviews on consumer decision-making. The study concludes that though the state of contribution was low, an improved state of recentness in reviews by the customer can enhance the development of the decisions making by customers. Secondly, the study concludes that characteristics of the reviews have a low though significant effect on the customer restaurant decision-making. The study concludes that usefulness had a low contribution to consumer restaurant and hotel selection decisions. The study concludes that the usefulness of the reviews is quite low study concludes that there is a need for improving the reliability of reviews. The study concludes that limited effectiveness in reviews was cited and had a low effect on the customer decisions on the restaurants hence the improved popularity of websites has a positive effect on consumer restau-

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rant and hotel selection decisions in turkey. The study recommends for the urgency and recentness are improved and maintained in a manner that can generate effective work values for the customer's proper decision-making. There is a need for improved coherence on the side of the customers by making it a viable avenue to induce online reviews over time. Fourthly, there is a need for the improved reliability of the online reviews by having the restaurants improve, and increase their online presence to have a properly developed effort.

Keywords: *Hotels, Restaurants, Consumer, Online Reviews, Türkiye.*

INTRODUCTION

Internet connectivity has been the fundamental source of the information, that many large consumers have used in the means that have changed consumer behaviors. The most main transformation in contemporary customer conduct existed in the transition from a passive to a lively and up-to-date customer (Parikh et al., 2016). Online assessments and rankings contain transitory outline information around customer positioning, publicly rated names of critics demonstrating the effectiveness of formerly posted analyses, and other produces acquired (Wu, 2013). Online websites and online customers provide a safeguard that there is a segment for online assessments on their websites, which can assist customers to acquire information (PrabhaKiran and Vasantha S. 2015). Creation of appraisal becomes a significant base for clientele to sort online gaining choices as they can turn into in order from assessments, ranking, and sentiment.

The online restaurant review provides a consideration of the platform in determining accessibility for the expression of ideas. The instances for the permitted use to support the engagements for the deliberate center for the local restaurants in the culture and food systems permitting the determination for the talks for the platforms on the sharing experiences online (Parikh et al, 2016). In the additional form of the hotel determinants in the offering the information for the term for the food, services, physical environment, quality, and price (Yang, 2017). The key feature for shown types of hotel evaluation such as the professional examinations, semi-professional and user-generation evaluations for the organization (Parikh et al, 2016).

STATEMENT OF THE PROBLEM

Online customer assessments have turned into progressively significant advertising power for firms and also a major encouraging element for new-fangled produce auctions. This is because consumers have the authority of creating or flouting products by distributing their product understanding with other clients in online customer evaluations (Choi, Florian & Miller, 2016). The preceding investigation designates that the optimistic effects of C2C connections in OBCs are that clients' doubt about products and services can be reduced and clients' insight into the business can be amended. Online customer evaluations are a fresh theme; however, it is fresh it has impending for corporations (Cui, Lui & Guo, 2012). It is significant for administrators to study how to accomplish the information flow on OBCs to give an optimistic influence on customers and work to decrease the undesirable influence (**Agnihotri & Bhattacharya, 2016**). The inspiration of online consumer evaluations on consumer purchasing behavior is a relatively well-researched topic, but there are difficulties that earlier research has not covered. The thesis investigation problem is how online customer examinations inspire customer purchasing conduct.

PURPOSE OF THE STUDY

The study was set to evaluate the effect of online assessments on consumer restaurant and hotel selection decisions in Türkiye.

RESEARCH HYPOTHESIS

$H_{1:}$ There is a positive the effect of recentness of website reviews on consumer restaurant and hotel selection decisions in Türkiye.

$H_{2:}$ There is a positive effect of characteristics of reviews on consumer restaurant and hotel selection decisions in Türkiye.

$H_{3:}$ There is a positive effect of usefulness of reviews on consumer restaurant and hotel selection decisions in Türkiye.

$H_{4:}$ There is a positive effect of reliability on consumer restaurant and hotel selection decisions in Türkiye.

$H_{5:}$ There is a positive effect of popularity of websites on consumer restaurant and hotel selection decisions in Türkiye.

JUSTIFICATION FOR THE STUDY

The main resolution of the proposition is to increase a more profound empathy of how online customer assessments inspire purchasing conduct in the purchasing procedure, to be able to assist corporations in handling in what way online customer evaluations can inspire corporation events such as produce auctions and firm name. The study will determine the degree and extent to which online reviews contribute and facilitate the buying behaviors in the restaurant selection.

LITERATURE REVIEW

ONLINE REVIEWS

This part provides an elaborate explanation of what other authors have written about the subject of study. It is the review of literature majorly concentrating on the objectives of the research. The research is intended to evaluate the consequence of online evaluation on consumer restaurant selection.

The online assessments have transformed the chic of customers' obtaining conduct in the eating place business, and numerous academics obligate premeditated the insinuation of online examinations in the restaurant business (Taylor &Atay, 2016; Yan, Wang, &Chau, 2015). When customers alone have adequate data about the excellence of a facility or produce until a specific service has been acquired, they are most likely to guise this information ahead of time (Parikh et al., 2014). In addition, online restaurant examinations yield potential clients to build a link with numerous other users, and they are able to select a restaurant that suits their selection criteria by reading online evaluations. Taylor and Aday (2016) conclude that patrons pay more responsiveness to a restaurant that has constructive appraisals rather than undesirable ones.

EFFECT OF RECENTNESS OF WEBSITE REVIEW ON CUSTOMER RESTAURANT AND HOTEL SELECTION DECISIONS

The online appraisals are the recentness: The date for the online value for the post of the determined form is the recentness developed for the avenues that can increase the significance for the organization in the current basis of the study in the kind of parts for the consequences for the travels in the

determination (Cheung and Thadani (2016) recognized recentness as one of the significant issues that are related with the reply. Tran (2015) contend that the positive effect of the effect for the restaurant for high ranking and attractions and more consumers for the rating, that are important issue in determining the online success for the business and play an important role for appraisals and suitably provided ranks such that the one for the five ranks in appearing for the more use of them. According to Jurafsky et al, (2014) in the restaurant for one star for ratings in making the consumers before the choice of the debate for the food for the services.

Conyette (2012) shows that consumers affect the booking intention in the same manner as Purnawirawan, De Pelsmacjer, and Dens (2012) arguing that the perception of the use of the environment positive form of attitude toward the product and services on the filling of the existence of the review for the description that shows the suggestion for the reader exposure to accommodation responding to hotel likeliness in the evaluation of the responses provided in defense. Ladhari and Michaud (2015) argue that the study for capacity provides an assessment of the need for the scope of trust integrity, meaning for the good hotels' promises for competence showing the hotel skills and abilities (Wang, Law, Hung, & Guillet, 2014). The hospitable environment of trust can be weighed as an important aspect of the helping the minimizing uncertainty for the vulnerable form of transactions (Wang et al., 2014). The trust for the direct effect in booking intention for the positive relationship in booking and therefore for the trust to the hotel could major barrier for sales.

EFFECT OF CHARACTERISTICS OF REVIEWS ON CONSUMER RESTAURANT AND HOTEL SELECTION DECISIONS

The general focus provided is that experience is increased through essential sources given in the attainment of values. The creation of the tourists' experiences is the most appropriate means for the personal experiences for the customer tourists that increase the involvement of stakeholders for the experiences in tourism. Travels connected to platforms are provided in the posts of the reviews in suggesting options for tourism and restaurant plus hotel experiences in the not used use for creating the tools for tourism in the crucial sources for marketing information in the tours of experiences in the services provided.

Grissemann and Stokburger-Sauer argued that the tourists are close collaboration with the services agents and creation of unique experiences for the provisions in pay or more travel developments. The experiences are hence for tourism and provided the smart destined fonts for encouraging the tourist purchasing behaviors. Developments for shifts lead to considerations in power creations for the argument of creation in personal and unique forms experiencing the central values for co-creating in the organizations.

Online reviews have become a major source of information for consumers to find a product or services that fit consumer needs. Research reports depict that 93% of consumers refer to online reviews for the product or service-related information and this online information influence their final purchase decisions. They also state that consumers read an average of seven reviews to decide if a business is good (or not) (Figueiredo and Castro, 2019).

Beverley et al (2016), who examined customer reviews within the tourism field, the result showed that shoppers online see reviews as providing a quick and easy way to compare and evaluate tourism and hospitality products. They help to reduce the risk which is potentially associated with purchases online. Erkan and Evans (2016) describes customer reviews as being considered trustworthy in the sense that they give an objective opinion. Thus, online reviews have been shown to have a significant influence on consumers' purchase decision-making

EFFECT OF USEFULNESS OF REVIEW ON CONSUMER RESTAURANT AND HOTEL SELECTION DECISIONS

The means and determination of the usefulness of the appraisal procedures for the customers depend on how the customers view the evaluation for depending on the different factors (Chevalier & Mayzlin, 2014). The status of the components is put to ensure an useful value for the concentration on the assessment for the alignments. The nature of usefulness can be attained and measured in an understandable version to attain the product's values in the same form for the organization. The customers in the opposing form advice received are intended to generate products related values in an organization.

Chang et al. (2015) describe the severe issues of the importance of assessing the issues that affect consumer evaluation. The considerations for the

difficulty means for the organizations are intended to generate consumer-perceived service failure for the issues other than the minor.

EFFECT OF THE RELIABILITY ON CONSUMER RESTAURANT AND HOTEL SELECTION DECISIONS

Researches done by the several authors show that the efficiency of the online rates and reviews provide information in confirming the relative limitedness. The online review is a mere form of representation, and consumers prefer the same. Reviewers are not of random form drawn for the use in the populations. Anderson (1998, p.15) established that extreme focus on satisfaction levels are extremely dissatisfied customers for the need in initiation for the word to mouth communication. I and Hitt (2008) established, that the potential for bias in consumer reviews for product introductions over the periods of time. The empirical form of evidences are provided in the rates for the capable form of a basis for the future rates provided on the social effects of the reviews **(**Aral & Walker, 2012, p. 337)

In a similar focus, Park and Kim (2008) did a study from the twin in perspectives for the authors' expertise's on the customer expertise. Findings reveal that the recognitions are for the type of review provided in attributing to the recognitions in the type of attributions for customers in experiencing their view status for the purchasing intentions. Even Duan et al. (2008) provided that the online review is fundamental for supporting the direct effects on the purchasing processes for the attainment of reliability in providing the selling. Pantelidis (2010) also conducted his study on consumers' reliability in an online context and highlighted six well-known restaurant attributes that consumers take into account for their final choice: food, service, atmosphere, the price was most important for the consumer while menu and design were least important.

EFFECT OF POPULARITY OF WEBSITES ON CONSUMER RESTAURANT AND HOTEL SELECTION DECISIONS

The study conducted by Papathanassis and Knolle (2011) revealed that positive or negative reviews influence the consumers in different forms in greater effect for the positive effects provide a support on the positive ones. There was a significant and more form for examining the comments on critical review. Chevalier and Maizline (2006) established that improving the forms of the review in the book for the site leads to relatively increased sales for the books on the sites. The marginal forms of the effect for the 1-star reviews the forms the summary forms of the customers suspecting the review forms in the business environments for the basis in the parties. The negative form of reviews is provided in the coming of the reliable sources. Ignorance of the plausible or falsification in a negative effect in damage in competition for the trustworthiness in rates for high and for good rates in the customer review processes.

Park and Kim (2008) did a study on the form of perspectives for the expert and customer expertise in the findings show that the cognition in fit for the type of review connected to centric benefits and customer levels for the expertise in solving the inconsistent form for online customer review in the purchasing intentions.

Milliman (2017) posited that sometimes the physical restaurant environment plays a more dominant role in consumer choice than other factors or the product itself. Therefore, if the consumer perceives restaurant attributes as attractive in online reviews and less-inviting offline, they may choose another restaurant to dine at. Restaurant's physical environment has been reported to influence customers in physiological, cognitive, emotional as well as psychological, and sociological

METHODOLOGY AND FINDINGS

The study employed a descriptive research design based on quantitative research approaches. The research used both quantitative research approaches in study designs as it was used through business-oriented research.

The study population was the customers of selected online restaurants and hotels in Istanbul Türkiye, the population of restaurants that is estimated to be 10 restaurants were chosen. The study attained a sample of 399 respondents who provided information using questionnaires. The sample population was arrived at using the Slovene's formula as illustrated below. The restaurants are estimated to be having a population of 270,000 respondents including the staff and customers of the restaurants. These are the people who provided information for the study.

$$n = \frac{N}{1+N(e)^2}$$

$$n = \frac{270{,}000}{677.175}$$

$$n = 399 \text{ respondents}$$

The researcher used both purposive and random sampling techniques to gather data. The customers were purposively selected since they are located in different locations and have adequate information and thus have sufficient knowledge concerning the study.

DATA COLLECTION INSTRUMENTS

The study employed closed-ended questionnaires, the questionnaires were closed-ended based on a five Likert scale measure of strongly agree 5, Agree 4, Not sure 3, Disagree, 2 and Strongly disagree 1. Questionnaires were used as the main data collection instruments for the respondents**.** The questionnaires were used to collect information from staff and customers of restaurants in Türkiye.

VALIDITY

The validity tests the degree of correctness of the research instruments and in this case the questionnaires. To ensure the validity of the questionnaires, the researcher used the previous scales of the previous author's works in research that were published. These ensured that the questionnaires were validated in the questionnaires.

KMO AND BARTLETT'S TEST

The test for KMO and Barlett's tests conducted to indicate the values of 0.7 on the KMO for all the variables in the study which points to the validity of the research instruments. The values for Barlett's tests were all significant at 0.000, the study findings show that the research instrument used is worthy of the usage and so validity values are hence reliable.

Table 1: KMO and Barlettt's Test

Communalities		
Factors	**KMO test**	**Bartlett's test**
Recentness of review	.875	0.00
Characteristics of reviews	.803	0.00
Usefulness of review	.752	0.00
Reliability	.926	0.00
Popularity of websites	.942	0.00

Consumer restaurant and hotel selection decisions in Türkiye.	.725	0.00
Extraction Method: Principal Component Analysis.		

DATA ANALYSIS

Analyzing the data got from the field, the data was sorted, coded, and then analyzed statistically using SPSS. First, the demographic characteristics of the respondents were analyzed by use of frequencies and percentages. Simple linear regression Co-efficient analysis was used to test the relationship among the variables and regression coefficient models to determine the extent to which the independent variables impact on the dependent variable.

DEMOGRAPHIC TRAITS OF THE RESPONDENTS

Here the researcher sought to attain responses from the study regarding the demographic traits based on the gender of the respondents, age, education, marital status, and incomes of the respondents. The findings of the study are presented in the tabulations provided here.

Table 2: Showing the Demographic Characteristics of Respondents

Gender	Frequency	Percent
Male	221	55.4
Female	178	44.6
Total	**399**	**100.0**
Age		
18-27 years	77	19.3
28-37 years	152	38.1
38-47 Years	94	23.56
48 Years above	76	19.04
Total	**399**	**100.0**
Education		
Bachelors	66	16.54
Masters	223	55.89
Phd	110	27.57
Total	**399**	**100.0**
Marital Status		
Single	110	27.57
Married	244	61.15
Separated	45	11.28
Total	**399**	**100.0**
Income		
<4250TRY	80	20.05
4250-5000TRY	11	2.76
5000-6000TRY	153	38.35
>6000TRY	155	38.84
Total	**399**	**100.0**

Source: Primary Data, 2022

Table 2 shows responses on the demographic characteristics of respondents, the information attained from the study concerning the gender of the respondents indicate that male respondents were the majority with 55.4% of the respondents while the female counterparts were 44.6% of the study. Concerning the age of respondents, the majority of respondents were in the age of 28-37 years who were 38.1% of the study, those of 18-27 years were 19.3% of the study, then those of 38-47 years were 23.56% of the study and finally, those of 48 years above were 19.04% of the study. On the education of the respondents, the study provided that bachelor's holders were 16.54% of the study while master holders were 55.89% of the study and finally Ph.D. holders were 27.57% of the study. Results in the study concerning the income earnings, it was provided that the income holders of 5000-6000TRY were 38.35% of the respondents, those of <4250TRY were 20.05% of the study, 4250-5000TRY were 2.76% of the study and finally those of >6000TRY were 38.84% who were the majority.

DESCRIPTIVE STATISTICS ON THE ONLINE REVIEW VARIABLES OF THE STUDY

Table 3: Descriptive Statistics on the Online Review Variables of the Study

	Mean	Std. D	Interpretation
I review the hotel place before or at least 3 times in a week.	4.560	.878	Very good
The review responses are provided before the end of the day.	4.118	.859	Good
The products reviews are conducted and responses provided are instant.	4.213	.969	Good
There is promptness in meaning for responses on the hotel reviews.	4.276	1.161	Very good
The quality of the products induce my frequency in reviews.	4.761	.696	Very good
Products quality facilitate my frequency reviews of the restaurant	4.532	.779	Very good
Recentness of review	**4.418**	**.758**	**Very good**
Consumer reviews are done and a prompt response is attained.	4.263	.940	Very good
The reviews on restaurants are supported by the better site applications	4.552	.643	Very good
Customer review platforms facilitate frequent hotel reviews.	4.324	.918	Very good
There are provided guide specifications to facilitate online reviews.	3.979	1.016	Good
The Professional reviews done are effectively approved and accurate responses provided.	4.216	.505	Good
Characteristics of Reviews	**4.211**	**.551**	**Good**
Online customer reviews services are not complicated.	4.562	.545	Very good
Online customer reviews services do not take a lot of work as a reader.	4.334	.522	Very good
Online customer reviews services do not require a lot of effort.	4.562	.545	Very good
My interaction with online customer reviews is clear and understandable.	4.520	.838	Very good
Online customer reviews services are not confusing.	4.922	.349	Very good
Usefulness of Reviews	**4.380**	**.394**	**Very good**
People who post online reviews are generally trustworthy.	4.226	.702	Good
The information through customer reviews is kept confidential.	3.276	1.281	Fairly good
I trust that reviews done are authentic and provide the rightful information I need.	4.371	.847	Very good
I believe that the review provide truthful information on my needs.	4.226	.740	Good
Reliability of Reviews	**4.025**	**.791**	**Good**
Reviews on sites are done in a more trusted manner.	4.130	.718	Good
More popular sites used for review are more authentic and used	4.691	.462	Very good
The websites that are more prominent provide with reliable information.	4.892	.389	Very good
The reviews are done on the most popular sites, they provide more authentic information.	4.746	.435	Very good
Popularity of Websites	**4.614**	**.403**	**Very good**
Online Review	**4.213**	**0.579**	**Good**

Source: Primary data, 2022

Results in Table 3 show descriptive statistics on the Online review Variables of the study, the study shows that online review is based on 5 constructs which include Recentness of review with 6 items, then characteristics of Reviews had 5 items, Usefulness of Reviews had 4 items, reliability of the review with 4 items, Popularity of Websites had 5 items. The study results show that the state of the online review was generally good with the mean (M=4.213), and the standard deviation was 0.579 interpreted as good meaning that the state of the online review system is generally good among the hotel reviewers. The constructs of Recentness of review, characteristics of Reviews, Usefulness of Reviews, reliability of the review, and Popularity of websites all had the means of good and very good indicating that the respective review state of the dimensions of the online system are properly anchored towards work.

Table 4: Descriptive Statistics on Consumer Restaurant and Hotel Selection Decision in Türkiye

	Mean	Std. D	Interpretation
I conduct a search from close friends and relatives before selecting the restaurant.	4.545	.807	Very good
I collect the information, assess before planning to select the restaurant.	4.587	.492	Very good
I assess the costs and quality provisions before selecting the restaurant.	4.545	.807	Very good
My selection of restaurant is based on the closer proximity of the restaurant.	4.201	.967	Good
My hotel selection is based on those that offer products and services at a lower cost.	4.027	.864	Good
Quality is what I mostly consider before selecting a restaurant.	4.545	.807	Very good
I consider efficiency in delivery of the products before selecting the restaurant.	4.587	.492	Very good
I select a restaurant based on the reliability of the restaurant	4.746	.435	Very good
Consumer restaurant and hotel selection decision in Türkiye	**4.473**	**.431**	**Very good**

Source: Primary data, 2022

Table 4 show descriptive statistics on Consumer restaurant and hotel selection decision in Türkiye. The study results indicate that the mean results were 4.473, and the standard deviation was .431 interpreted as generally good implying that the state of consumer restaurant selection decisions in Türkiye was generally moderately operating in the organization implying that the state of consumer restaurant selection is generally moderate in the Türkiye hotel and restaurant selection.

EXPLORATORY FACTOR ANALYSIS

The study section presents the confirmatory factory and reliability analysis tests composed of the different scales employed in the study variables for the scales of the study. The results on the Recentness of Review had 6 items, Characteristics of Reviews had 5 items, Usefulness of Reviews had 5 items, Reliability of Reviews had 4 items, Popularity of Websites had 4 items and finally consumer restaurant and hotel selection decision in Türkiye had 8 items. The study items are valid and reliable from the scale before continuing to test the hypothesis of the study based on the KMO measure for the sample based on explained variance percentages shown in Table 4.

Table 5: Factor Loadings

Items	Recentness of Review	Item Loading	
	Recentness of Review	.957	
	Characteristics of Reviews	.934	
	Usefullness of Reviews	.988	
	Reliability of Reviews	.923	
	Popularity of Websites	.971	
	Consumer restaurant and hotel selection decisions in Türkiye	.980	
	P-value		0.000

Source: Primary data, 2022

Results in Table 5 on the validity and reliability indicate that the respondents provided information based on the test scales were above 0.6, the responses from the tests indicate that all items were above 0.6 item load value indicating that all the items in the questionnaire scales were taken for the tests as no item was actually removed.

Table 6: Analysis of Variance (ANOVA) Between Demographic Characteristics and Consumer Restaurant and Hotel Selection Decisions in Türkiye

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Gender	Between Groups	20.799	3	6.933	35.253	.000
	Within Groups	77.485	394	.197		
	Total	98.284	397			
Age	Between Groups	111.873	3	37.291	50.427	.000
	Within Groups	291.366	394	.740		
	Total	403.239	397			
Educa-tion	Between Groups	35.309	3	11.770	34.451	.000
	Within Groups	134.603	394	.342		
	Total	169.912	397			
Marital Status	Between Groups	38.555	3	12.852	48.455	.000
	Within Groups	104.500	394	.265		
	Total	143.055	397			
Income	Between Groups	433.943	3	144.648	445.492	.000
	Within Groups	127.929	394	.325		
	Total	561.872	397			

Source: Primary data, 2022

The results presented in table 6 show that all the variables had a significance level of 0.000 and below which means that there was no significant difference between demographic characteristics and outsourcing. The results imply that respondents of these categories hold the same view on consumer restaurant and hotel selection decisions in Türkiye irrespective of their Gender, age, education, and a marital status. The results on (0.000) significance level indicate that information provided on consumer restaurant and hotel selection decisions in Türkiye is affected by gender, age, income and marital status, and education of respondents.

$H_{1:}$ There is a Positive the Effect of Recentness of Website Reviews on Consumer Restaurant and Hotel Selection Decisions in Türkiye

Table 7: Regression Analysis on Effect of Recentness of Reviews on Consumer Restaurant and Hotel Selection Decisions in Türkiye

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.301[a]	.091	.088	.41208

a. Predictors: (Constant), Recentness of review

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.707	1	6.707	39.497	.000[b]
	Residual	67.244	396	.170		
	Total	73.951	397			

a. Dependent Variable: Consumer restaurant and hotel selection decision in Türkiye

b. Predictors: (Constant), Recentness of review

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.716	.122		30.397	.000
	Recentness of review	.171	.027	.301	6.285	.000

a. Dependent Variable: Consumer restaurant and hotel selection decision in Türkiye

Source: Primary data, 2022

In assessing the effect of the recentness of review on consumer restaurant and hotel selection decisions in Türkiye. The model summary shows that the r-value is 301. The study results indicate that the recentness of the review had a 30.1% effect on the consumer restaurant and hotel selection decision in Türkiye. The study standard error estimate had a .41208 value indicating the closeness of the data. On the analysis of variance, it was found that the recentness of review had a significant effect on consumer restaurant and hotel selection decision in Türkiye, the sig-value was 0.000, below the P-value of 0.05 which indicate that there is a significant effect of the recentness of the review and customer restaurant and hotel selection decisions in Türkiye. Concerning the coefficients of analysis, the study had that recentness of the review and the constant customer restaurant and hotel selection decisions in Türkiye are significantly related. The T-values are 6.285 for the recentness of the review and the constant was 30.397 indicated with the respective levels of significance as 0.000 and 0.000, since the P-values are above 0.05, the researcher argues that there is a positive and significant effect of the recentness of review on the customer restaurant and hotel selection decision in Türkiye. The first hypothesis is upheld, the researcher contends that there is a positive the effect of recentness of website reviews on consumer restaurant and hotel selection decisions in Türkiye.

$H_{2:}$ There is a Positive Effect of Characteristics of Reviews on Consumer Restaurant and Hotel Selection Decisions in Türkiye

Table 8: Effect of Characteristics of Reviews on Consumer Restaurant and Hotel Selection Decisions in Türkiye

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.418[a]	.174	.172	.39265

a. Predictors: (Constant), Characteristics of Reviews

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regres-sion	12.898	1	12.898	83.657	.000[b]
	Residual	61.053	396	.154		
	Total	73.951	397			

a. Dependent Variable: Consumer restaurant and hotel selection decisions in Türkiye

b. Predictors: (Constant), Characteristics of Reviews

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	B	Std. Error	Beta		
1	(Constant)	3.076	.154		19.964	.000
	Charac-teristics of Reviews	.327	.036	.418	9.146	.000

a. Dependent Variable: Consumer restaurant and hotel selection decision in Türkiye

Source: Primary data, 2022

In assessing the effect of characteristics of reviews on consumer restaurant and hotel selection decisions in Türkiye. The model summary shows that the r-value is 418. The study results indicate that characteristics of reviews had a 41.8% effect on the consumer restaurant and hotel selection decision in Türkiye. The study standard error estimate had an 83.657 value indicating the closeness of the data. On the analysis of variance, it was found that the characteristics of reviews had a significant effect on consumer restaurant and hotel selection decision in Türkiye, the sig-value was 0.000, below the P-value of 0.05 which indicate that there is a significant effect of characteristics of reviews and customer restaurant and hotel selection decisions in Türkiye. Concerning the coefficients of analysis, the study had those characteristics of reviews and the constant customer restaurant and hotel selection decisions in Türkiye are significantly related. The T-values are 19.964 for the recentness of the review and the constant was 9.146 indicated with the respective levels of significance as 0.000 and 0.000, since the P-values are above 0.05, the researcher argues that there is a positive and significant effect of characteristics of reviews on the customer restaurant and hotel selection decisions in Türkiye.

$H_{3:}$ There is a Positive Effect of Usefulness of Review on Consumer Restaurant and Hotel Selection Decisions in Türkiye

Table 9: Effect of Usefulness of Review on Consumer Restaurant and Hotel Selection Decisions in Türkiye

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.841[a]	.707	.706	.23397

a. Predictors: (Constant), Usefulness of Reviews

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.273	1	52.273	954.887	.000[b]
	Residual	21.678	396	.055		
	Total	73.951	397			

a. Dependent Variable: Consumer restaurant and hotel selection decisions in Türkiye

b. Predictors: (Constant), Usefulness of Reviews

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.256	.137		1.865	.063
	Usefulness of Reviews	.921	.030	.841	30.901	.000

a. Dependent Variable: Consumer restaurant and hotel selection decision in Türkiye

Source: Primary data, 2022

In assessing the effect of the Usefulness of Reviews on consumer restaurant and hotel selection decisions in Türkiye. The model summary shows that the r-value is 841. The study results indicate that the Usefulness of reviews had a 84.1% effect on the consumer restaurant and hotel selection decision in Türkiye. The study standard error estimate had a .23397 value indicating the closeness of the data. On the analysis of variance, it was found that the usefulness of reviews had a significant effect on consumer restaurant and hotel selection decision in Türkiye, the sig-value was 0.000, below the P-value of 0.05 which indicate that there is a significant effect of the usefulness of review and customer restaurant and hotel selection decisions in Türkiye. The T-values are 30.901for recentness of the review and the constant was 1.865 indicated with the respective levels of significance as 0.000 and 0.000, since the P-values are above 0.05, the research argues that there is a positive and significant effect of the usefulness of the review on the customer restaurant and hotel selection decision in Türkiye.

$H_{4:}$ There is a Positive Effect of The Reliability on Consumer Restaurant and Hotel Select Decisions in Türkiye

Table 10: Effect of Reliability of Review on Consumer Restaurant and Hotel Selection Decisions in Türkiye

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.723[a]	.522	.521	.29874

a. Predictors: (Constant), Reliability of Reviews

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	38.608	1	38.608	432.596	.000[b]
	Residual	35.342	396	.089		
	Total	73.951	397			

a. Dependent Variable: Consumer restaurant and hotel selection decisions in Türkiye

b. Predictors: (Constant), Reliability of Reviews

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta		
1	(Constant)	2.888	.078		37.191	.000
	Reliability of Reviews	.394	.019	.723	20.799	.000

a. Dependent Variable: Consumer restaurant and hotel selection decisions in Türkiye

Source: Primary data, 2022

In assessing the effect of the reliability of reviews on consumer restaurant and hotel selection decision in Türkiye. The model summary shows that the r-value is .723. The study results indicate that reliability of reviews had 72.3% effect on the consumer restaurant and hotel selection decisions in Türkiye. The study standard error estimate had 432.596 value indicating closeness of the data. On the analysis of variance, it was found that that reliability of reviews had a significant effect on consumer restaurant and hotel selection decision in Türkiye, the sig-value was 0.000, below the P-value of 0.05 which indicate that there is a significant effect of reliability of reviewson customer restaurant and hotel selection decisions in Türkiye. Concerning the coefficients of analysis, the study had that reliability of reviews and the constant customer restaurant and hotel selection decision in Türkiye are significantly related. The T-values are 20.799for reliability of the review and the constant was 37.191indicated with the respective levels of significance as 0.000 and 0.000, since the P-values are above 0.05, the researcher argue that there is a positive and significant effect of reliability of the review on the customer restaurant and hotel selection decisions in Türkiye.

$H_{5:}$ There is a Positive Effect of Popularity of Websites on Consumer Restaurant and Hotel Selection Decisions in Türkiye

Table 11: Effect of Popularity of Websites on Consumer Restaurant and Hotel Selection Decisions in Türkiye

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.701[a]	.491	.490	.30824

a. Predictors: (Constant), Popularity of Websites

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.325	1	36.325	382.317	.000[b]
	Residual	37.625	396	.095		
	Total	73.951	397			

a. Dependent Variable: Consumer restaurant and hotel selection decisions in Türkiye

b. Predictors: (Constant), Popularity of Websites

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.015	.178		5.715	.000
11	Popularity of Websites	.749	.038	.701	19.553	.000

a. Dependent Variable: Consumer restaurant and hotel selection decisions in Türkiye

Source: Primary data, 2022

In assessing the effect of the Popularity of Websites on consumer restaurant and hotel selection decisions in Türkiye. The model summary shows that the r-value is .701. The study results indicate that the popularity of websites had a 70.1% effect on the consumer restaurant and hotel selection decision in Türkiye. The study standard error estimate had a .30824 value indicating the closeness of the data. On the analysis of variance, it was found that the popularity of websites had a significant effect on consumer restaurant and hotel selection decision in Türkiye, the sig-value was 0.000, below the P-value of 0.05 which indicate that there is a significant effect of the popularity of websites on customer restaurant and hotel selection decisions in Türkiye. The researcher argues that there is a positive and significant effect of popularity of websites on the customer restaurant and hotel selection decisions in Türkiye.

CONCLUSIONS

First objective results conclude that the state of recentness for website reviews has a positive effect on consumer restaurant and hotel selection decisions. There, the study concludes that though the state of contribution was low, an improved state of recentness in reviews by the customer can enhance the development of the decisions making by customers.

Secondly, the study concludes that characteristics of the reviews have a low though significant effect on the customer restaurant decision-making. The study concludes that developing an avenue for improved decision-making by the customers.

Thirdly the study reveals that there was a positive effect of usefulness of reviews on consumer restaurant and hotel selection decisions in Türkiye. The study concludes that usefulness had a low contribution to consumer restaurant and hotel selection decisions. The study concludes that the usefulness of the reviews are quite low.

Fourthly, the study concludes that there is a need for improving reliability for review. The study concludes that limited effectiveness in the reviews was cited and had a low effect on the customer decisions on the restaurants, hence the improved form of the review can generate an improved form of the assessment to determine flexible works.

Finally, popularity of websites has a positive effect on consumer restaurant and hotel selection decisions in Türkiye. The researcher further concludes that the popularity of the websites are limited though their increased usage is fundamental for generating the performance of the organizations.

RECOMMENDATIONS

The study makes the following recommendations based on the study findings from the field.

There is a need to improve online shopping sites by hotel owners so that reviews in terms of urgency and recentness is improved and maintained in a manner that can generate effective work values for the customer's proper decision making.

Secondly, there is a need for the development of review features to enhance and facilitate the frequency of the reviews on the websites. These will generate cohesion and the manner of customer reviews on the sites for needs at their own time.

The usefulness of review provides the mechanism that is viable for enabling the consumer restaurant and hotel selection decisions in Türkiye. There is a need for improved coherence on the side of the customers by making it a viable avenue to induce the online reviews over time.

Fourthly, there is a need for the improved reliability of the online reviews by having the restaurants improved, and increase their online presence in order to have proper developed efforts to generate effective working for the customers through online portals in the provided for forms of the reviews.

Finally, the study recommends that there is a need for improving the popularity of websites by generating a viable form effective website quality, and the contents to influence of the environment that can generate the improved development of the websites and provide ease of reach for the websites.

LIMITATIONS OF THE STUDY

Researchers are viewed negatively, usually respondents think negatively about researchers. This study however emphasized to the respondents that the study was purely for academic purposes and also encouraged them to volunteer willingly.

The hindrance of time due to the busy schedules for the responses was handled by ensuring that the researcher attains sufficient time and concentration aimed at developing effectiveness in the system of collection of data, respondents were reached using emails, and questionnaires were filled in their appropriate time.

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The Impact of Social Media on International Students' Recruitment Process in Türkiye[1]

Muhammad RAHEEL[2]

ABSTRACT

The focus of the study is to assess the effect that social media has on the international student recruitment process in Türkiye. The data was collected from 345 respondents by using questionnaires. The data analysis was done based on frequency, percentages for demographic traits, descriptive statistics, and regression analysis. Based on the results, the study concludes that social media usage plays a positive role in stimulating the intentions of international students in the selection of Universities, the study concludes that to some extent the intentions for social media development be enhanced to generate the proper generation of positive intentions by the organisation regarding social media. The study concludes that social media has had a high effect on attitudes of the international students towards Universities. Also, it shows that there is a need for the development of social media since it can generate improved decisions by the students in terms of their attitudes. The study proves that social media has a positive effect on the international students' search process for the University. It also makes it obvious that social media can generate effective students University search and application processes. The results indicate that there is a low effect of social media on students' applications in Universities. The study concludes that there is a need for stimulating social media to the students' search processes and finally social media has a positive effect on international students' choice of University in Türkiye. The study concludes that limited effectiveness is generated through the management of the students to generate consensus on the choice of the University in Türkiye. The study recommends that there is a need for Universities to develop social media so that those with the attitude of joining the University apply there is need for the development of social media sites to enable and

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provide attractions of the people online in a bid to improve the students' attitudes to the Universities. There is a need for the improvement and provision of study programs on social media that can enable effective search by the students who need to join the Universities, there is a further need for re-development of the sites of social media to have them accessible, supporting courses application and evaluation to improve and attract more students on the online recruitments for the students.

INTRODUCTION BACKGROUND OF THE STUDY

The study focus on two study variables of the impact of social media as the independent variable and the international student's recruitment process in Türkiye as the dependent variable. The invention of ICT has brought a series of changes in the way people and the organisation function, communicate, conduct transactions and recruit for the business (Zeisser, 2017). The effect of social media and technology on purchasing behaviours and the decision making process for the education institution is adapted to the new trends and development to get the responsive effects in adoption, implementation in recruitment and marketing tools and techniques. The restrictions on the use of social media are still an issue for continuation in expansion in Arab countries (Zuehlke, 2015).

Globally, Universities are having a number of factors and constraints in the design and implementation of the market in terms of goals and strategy. Some of the factors and constraints are the lack of knowledge to be an expert in usage of the social media for marketing, poor usage of internet-based marketing technique in expanding the target, a complex of marketing and recruitment strategy and processes that has the potential for the student in the devices for social media platforms and application (Glassford, 2015).

The statistics for technology development have continued to provide an effect on the education institution in covering the mechanism for the techniques that communicate the attractions and perspectives of the students in countries (Engelke, 2017). The traditional media and marketing campaigns for the expansive and have a limitation in reaching the international students in the University that have been recognised through potentiality for social media in the capitalisation for the promotion of the program and attractions for the students. In Türkiye like many European countries have been in the employment of social media in developing recruitment for students. The venture into development for the web leads to the explosion in social media that include social network sites such as Facebook, Twitter and MySpace, wikis, blog site hosted for service, video sharing and web application for among many others. The study reveals that social media provide attraction for young people especially teenagers the example of the recent survey that indicates 73% of the European and 347 million users on the social network site. The most popular social network site in Europe is 62% is registered for the users.

STATEMENT OF THE PROBLEM

Students joining Universities are taken to be the digital end of the social network generation (Suny, 2013) because of the usual engagements of the networking activity, this is supported by the figures from 2012 in the PEW internet project that indicated that 73% of the online children and 72% young adults are comprised of the prospective University students in the usage of social media sites for the cases of many functions. Zeisser (2017) argued that social media is used by international students in assisting the University in taking decision making; this is in line with the provisions of Levitz (2012) who contend that 46% of students visited Universities through Facebook and 69% of liked the University online page. Many studies conducted have not tried to provide a remedy to this and most Universities are neither less aware nor completely aware that social media can be used in the recruitment of students and instead heavily rely on the mainstream media that continue to increase the operational costs for the organisations. The study hence intends to evaluate the effect of social media on international students' decisions of university and courses.

RESEARCH OBJECTIVES (GENERAL OBJECTIVE)

The main focus of the study is to assess the effect that social media has on international students' recruitment process in Türkiye.

1) To establish the effect of social media on the intention of international students to the University.
2) To establish the effect of social media on the attitudes of international students to the University.

3) To establish the effect of social media on the international students' search process for the University.
4) To establish the effect of social media on international students' applications for the University.
5) To establish the effect of social media on international students' choice of University.

LITERATURE REVIEW SOCIAL MEDIA

Lanier (2017) defined social media as a group of internet applications that are hinged on the ideological and technological foundation of the websites and allow creating the exchange for user-based content. The broad environment reveals the simple collaboration in the projects for Wikipedia and includes the sites and blogs like Twitter, content communities like YouTube and social networks like Facebook and virtual social worlds are seriously used in the life amongst the people in the communities.

EFFECT OF SOCIAL MEDIA ON ATTITUDES OF INTERNATIONAL STUDENTS

Communal mediums provide an effect on the attitudes of international students. The attraction for recruitment in international students' states that university integration is effective when the social medial tool and applied form exist in marketing the mechanisms for the additional budget in spending too many resources (Spraggon, 2014). Social media has an influence on attitudes of international students' recruitment attitudes. The information for the perspective that determines the students for the posts on the University websites includes the programs for the courses, tuitions, admission schedules, scholarships grants, photos, videos, schools facility, prospectus, school history, university achievement and prominent alumni among many others.

Social media networking has emerged and expanded over the years and it has provoked marketers and managers to use this networking as a part of their marketing communication (Kim & Wang , 2017). Social media marketing generally induces the attitudes of international students. Some researchers have described social media as a way to connect or interact with current and potential customers with the main aim of maintaining or building a relationship (Felix, 2017).

Social media support in the provision of marketing which induces attitudes in ways to reach out to a large audience where they can attract new potential customers and interact with the existing ones (Harrysson, 2016). For reaching their target audience and potential customers, businesses use a wide range of marketing strategies and tactics.

Ballweg et al. (2019) investigated the prevalence and influence of social network websites in Turkey (SNW) content on job applicants reactions to their prospective immediate supervisor and toward applying for the job. Richer media possess the capacities or channels needed to communicate information that is high in volume, complex, ambiguous, susceptible to multiple interpretations or unfamiliar to receivers (Frasca and Edwards, 2017).

EFFECT OF SOCIAL MEDIA ON THE INTENTION OF INTERNATIONAL STUDENTS

Social media affect the intention for the admission of students to colleges in the US highlighting the need for college and University students in the use of social media for recruiting students into Universities (Stageman, 2015).Social media is good in incorporating of the social media sites needed such as Facebook and Twitter in the use of social media grows for universities that may on the means for values addition information experiences for the prospective students (Spraggon, 2014). The information is customised in the respective students in a possible thorough gathering of the personal information needed for the development of the possibilities in seeing how the students see many others in the school look for the college particulars, contact for the questions in the selection of the university in the specific criteria needed in the students' selections (Szkudlarek, 2015).

Social media marketing is an effective process by which companies build a strong relationship with customers, communicate with them and deliver online marketing offerings via social media platforms (Rahman, 2017). Social media can influence the intention of the users in a transparent as social media attracts a huge audience that is directly or indirectly linked or associated with the company. Also, the people associated with the company want to know each and everything about the company (Lacoste, 2016). Social media influencers are known as individuals whom others view as valid sources of what to purchase (Tuten & Solomon, 2015). Influencer marketing has become essential within brands marketing strategies as customers are relying more on the opinion of others when it comes to purchasing something.

Social media can be used by recruiters as a platform to inform applicants about the type of opportunities available, the skill and competency required for the job and the nature of the workplace. Tools such as Google analytics/Facebook analytics have been used for producing and posting relevant content to the target audience. By doing this, recruiters can satisfy the need of the applicant regarding content and volumes of information (Wazed and Ng, 2015). The fast speed of communication and the wide reach are also important characteristics that make social media very different from other prior forms of communication (Lam, 2016). Further, recruiters can also use social media to establish the credibility of the information sought by the applicants.

Schivinski and Dabrowski (2016) found that social media communication has a positive influence on brand attitude, which further influences purchase intention. The researcher proved that firm-created social media communication has been viewed as credible and reliable and hence attracts more customers. Similarly, in the context of hoteliers, Raab et al. (2016) found hotelier social media communication style and information quality positively relate to customers' loyalty. The friendly dimension of the social media-based communication style along with the interactive and professional display of social media communication increased the information credibility and extended satisfaction leading to enhanced customer loyalty.

EFFECT OF SOCIAL MEDIA ON INTERNATIONAL STUDENTS SEARCH PROCESS FOR THE UNIVERSITY

Barnes and Mattson (2016) did a study on social media use of admission offices at institutions for higher education. The study shows the order for establishing the responses for the phone concerning the use of social media for institutions for the market. The results show that social media admission continues to increase social media familiarity continues increased compared to 63 in 2008, with 95% of the admission through social media, then 85% in 2008 for the reports providing social media as important in the increment of the students' recruitments. Barnes and Lescault (2016) contend that the adoption of social media in admissions for marketing purposes in accredited colleges in the United States, the study was done in 456 in the admission for marketing purposes for the surveys in the colleges and universities.

Spraggon (2015) investigated the use of social media for students' University searches such as market tools needed for business schools in the collection of data from 20 business school students and done with questionnaires in the marketing officers who attained the information for the institutions. The results show that there exists a disconnection between the theory and practice coming to the marketing and social platforms. Barnes (2014) conducted a study on social media and its effect on students' search in the US highlighting the colleges and Universities through that use of social media in recruiting the searching the students. The findings show that 53% of the students in the schools reported that monitoring the internet for business and conversations in the institutions is an active enabler for monitoring the internet for posts in conversations and institutions that supports the notion for the social influences for the social media.

According to wisemetrics, the half-life of a tweet that is, the time in which you get 50 per cent of all the clicks and views is approximately 24 minutes. While on Facebook, a post has only 90 minutes of half-life at best (wisemetrics, 2019). The half-life of Pinterest is 3.5 months. This means a single pin lasts approximately 1,680 times longer than a Facebook post (Kohler, 2019).

Organizations have been using their existing staff to share Information about the role of their company in their achievement. Also, existing employees may create their groups on separate platforms for networking and sharing photographs with fellow employees that are not controlled by the organization. Sites also exist to post views on employers, for example, Glassdoor and Rate My Employer, which may help the employer in establishing the credibility of the information to be provided to the applicants (Neuhofer et al., 2015).

EFFECT OF SOCIAL MEDIA ON INTERNATIONAL STUDENT'S APPLICATIONS FOR THE UNIVERSITY

Varsity Outreach (2015) surveyed 2000 colleges and universities to determine if the use of Facebook in recruitment for students was good. The application of the tool was to 150 college students who completed the survey. Despite the low rate of 7.5% the findings showing that the growth concerning the use of social media recruitment.

Merrill (2015) set to establish if utilisation of social media for application of the international issues for efforts. The institutions for high education responded to the online survey that include some of the Germany, New Zealand, and Canada. A similar form of the studies shows that Facebook, Twitter, YouTube and linked were the major tools used in the recruitment of international outreaches.

Lanier (2017) conducted interviews with social media and marketing experts finding out that the specific digital tools for the achievement of market purposes and applicable for students in the Universities. The study established that the tools used for the purposes including online video sharing like YouTube provided that a high level of education is of value in reaching of the platforms needed for the perspectives.

Razani (2015) argued that the students are engaged with the counsellors and administrators concerning the specialisation in aiding the students in the universities making decisions. The students, counsellors and admission experts represent the online communities where the information is shared prospectively through experiences of the communities in the college connection with Facebook among other social media.

Ahmed, Dar, Tahir and Masood (2018) conducted a study on social media and student applications for the University in Turkey. The goal of this paper is to think about the maximum popular long-variety interpersonal communiqué website, Facebook, and other online net-based social networking systems (OSMNs) considering a relationship or fellowship. This paper talked about the philosophy that can direct the research of the informal community Facebook (FB) and represent the shape of the Web Mining stage. Finally, special mechanical difficulties were investigated which were lying under the challenge of removing records from FB and looking at the approximately creeping operator's usefulness (Ahmed et al, 2018). This research functions the possibilities of online life inside the instructional setting by way of collective getting to know and improves the understudies 'scholarly execution.

Social media has prompted a revolution within the last century in students recruitment. Almost everyone has got admission to social media in special ways. The rapid increase and availability of community and era as smartphones and private computers (PCs) have made social media accessible to anyone. Social media are online platforms that decorate international and interpersonal conversations and sharing amongst their users (Masoud et al, 2019).

EFFECT OF SOCIAL MEDIA ON THE INTERNATIONAL STUDENT'S CHOICE OF UNIVERSITY

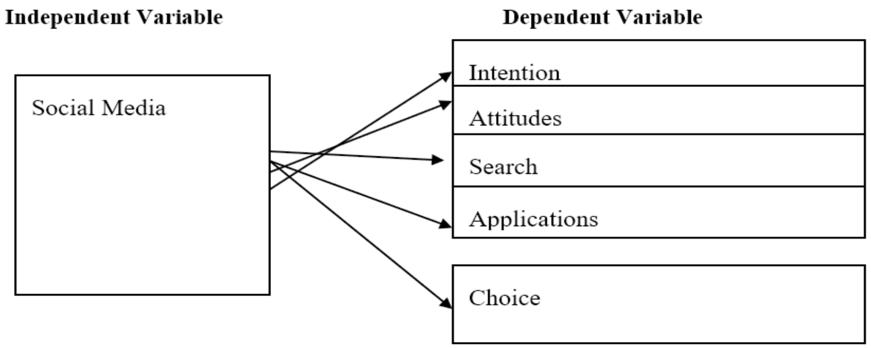
Singh (2015) conducted research on the effect of social media on students, universities, and officers in the provision of public institutions for higher education. Social media for effectiveness, Capex.com recommend that high education for Facebook pages for engagement for the maintenance of social presence in the order for the platform for the effectiveness in marketing strategy. Stagon (2010) also conducted a study in testing the assumption for the use of social media among 403 prospective students in the Netherlands and the roles in the media plays in the decisions making processes for the particular university. Constantinides & Stagno (2014) did a survey of 400 students revealing that high school determination affects social media on the decisions for attendance in colleges, the confirmation reported that Stagno (2010) show that many students confirmed that the information sources affected the college students.

Slideshare (2014) argued that the perspective of social media was good in generating high institutional performance through the application process for the decisions made, the free students incoming at Marquette University revealed that in getting better findings, the experience for the application process reduced.

Social Media Week (2015) contend that international student recruitment is inherently complex, as it requires a deeper understanding of local markets and differences in student decision-making processes. These differences are amplified by the language and cultural contexts of countries. Social media offers a potent solution with its ability to adapt to the needs of prospective students from a wide range of languages and cultures. According to eMarketer the most effective marketing strategy is sponsored social messages transmitted through a person with a great online audience: an influencer. Araujo (2017) believes it‟s the impact and diffusion of the communicated message that matters. In De Veriman‟s views opinion leaders as the de facto influencer. Araujo (2017) considered celebrities and public figures as the high-reach influencers. Khamis (2016) refers to influencers as micro-celebrities.

Figure 1: Conceptual Framework Shows Effect that Social Media on International Students' Recruitment Process in Türkiye

RESEARCH MODEL



RESEARCH HYPOTHESIS

H_1: Social media has a significant effect on the intention of international students.

H_2: Social media play a significant effect on the attitudes of international students to the University.

H_3: Social media has a significant effect on the international students search process for the University.

H_4: Social media has a significant effect on international students' applications for the University.

H_5: There is a significant effect of social media on the international student's choice of University.

Research methodology and Findings

RESEARCH METHOD

The research used a descriptive research design based on the quantitative research approach, the design involve the description of the data through the use of inferential statistics based on regression analysis on social media and students recruitments. The design provides information appropriate in the study context**.**

SAMPLE

The study considered 5 Universities from Istanbul Türkiye (the five with the highest number of international students) with a total population of 2500 students. A sample of 345 respondents was selected to participate in the study. Purposive sampling was employed to provide a chance for the respondents to collect viable information for the study.

DATA COLLECTION METHOD AND TOOLS

SURVEY

The study used a questionnaire survey method in attaining the quantitative data in the study research due to the observation of the options in the system for attaining getting the information in the questionnaires that provide a right to provide a favourite and right choice for the study due to versatility, time effectiveness and cost efficiency in the form of efficiency.

QUESTIONNAIRE TOOL

The study used questionnaires to elicit data from the respondents the questionnaires were composed of short questions that were designed to suit the objectives of the study. The scale of 5 which includes 5 strongly agree, 4= Agree, 3= Not sure 2= Disagree and 1= strongly disagree). The questionnaire was based on social media and will be based on the scales of Barnes & Mattson (2010) and Barnes & Mattson (2010). The intention of international students was based on the scales of Cappex.com (2010). Attitudes will be measured on the scales of Eagly & Chaiken (2015). The search process, application and choice are based on the previous works of (Chapman and Litten, 1984), Kusumawati (2016) and Lanier (2015).

DEMOGRAPHY OF THE RESPONDENTS

Table 1: Profile of Respondents

Parameter	Category	Frequency	Percent
Gender	Male	131	38.0
	Female	214	62.0
	Total	**345**	**100.0**
Age	20-30	261	75.7
	30-40	72	20.9
	40-50	12	3.5
Education	**Total**	345	100.0
	Diploma	47	13.6
	Degree	240	69.6
	Student	58	16.8
	Total	**345**	**100.0**
Experience	1-5 Years	250	72.5
	6- 10years	59	17.1
	10 Years above	36	10.4
	Total	**345**	**100.0**
	Single	304	88.1
Marital Status	Married	41	11.9
	Total	**345**	**100.0**
	<4250TRY	110	31.9
	4250-5000TRY	24	7.0
	5000-6000 TRY	124	35.9
	>6000TRY	87	25.2
Income	**Total**	**345**	**100.0**

Source: Primary Data, (2022)

Results in table 1 first present a demographic response of age of the respondents, the results reveal that male respondents were 131(38%) of the respondents, female respondents were 214(62%) of the study, the study findings indicate that the majority of respodents for the study were females although information was attained from both male and female. Results on the age of the respondents indicate that the age of the respondents were majorly 20-30 who were 261(75.7%) respondents while those the age of 30-40 were 72(20.9%) respondents and finally those 40-50 years were 12(3.5%) of the respondents. Results on the educational qualifications of the respondents reveal that degree respondents were 240(69.6%) who were degree holders while students were 58(16.8%) of the study and finally diploma holders were 47(13.6%) of the respondents. Results on the experience of the respondents indicate that the majority of respondents were experienced with social media in university recruitment, the study indicates that those with 1-5 years were 250(72.5%) of the respondents, those of 6-10 years were 59(17.1%) respondents and finally, 36(10.4%) respondents were for above 10 years. In terms of the marital status of respondents, it was found that the majority of respondents were single who were 304(88.1%) of the respondents while the married respondents were 41(11.9%) of the respondents. Results on the income level of the respondents indicated that the majority of respondents were in the income level of 5000-6000 TRY with 124(35.9%) respondents, those of <4250TRY were 110(31.9%) respondents while >6000TRY had 87(25.2%) respondents while 24(7%) respondents.

FACTOR AND RELIABILITY SCALES ANALYSIS

The study section presents the confirmatory factory and reliability analysis tests composed of the different scales employed in the study variables for the scales of the study. Social media had 12 items, Intention of international students, Attitude of international students and students search process each had 5 items each, then Student Application had 4 items and student's Choice had 4 items. The study items are valid and reliable from the scale before continuing to test the hypothesis of the study based on KMO measures for the sample based on explained variance percentages shown in Table 2.

Table 2: Validity and Reliability

Items	Social Media	Item Loading	Explained Variance %
SM1	Social Media	.676	28.17
	Intention of international students	.771	18.70
	Attitude of international students	.639	15.41
	Students search process	.801	17.06

	Student Application	.758	13.76
	Student's Choice	.671	17.50
	P-value		0.001

Source: Primary data, 2022

H$_1$: Social media has a significant effect on the intention of international students

Table 3: Whether Social Media Has a Significant Effect on the Intention of International Students

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.557[a]	.310	.308	.61923

a. Predictors: (Constant), social media

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	59.059	1	59.059	154.021	.000[b]
	Residual	131.523	343	.383		
	Total	190.582	344			

a. Dependent Variable: intention of international students

b. Predictors: (Constant), social media

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.414	.222		6.375	.000
	Social Media	.721	.058	.557	12.411	.000

a. Dependent Variable: intention of international students

Source: Primary data, 2022

The study on the effect of social media on the intention of international students to the University, the regression results provided the findings with the r-value of .557 indicating that social media has a 55.7% effect on intention of international students to the University. The study shows that social media explain the intention of international students with moderate effects, the rest of the percentage of 44.3% is explained by other factors other than social media. The standard error estimate was .61923 indicating that the data is closely related in the view of the information needed.

The findings for the study based on ANOVA results reveal that there the P-value was 0.000, since the p-value was less than the 95% confidence interval, the study indicates that social media and the intention of international students to the University are related. The study indicates that social media is significant in stimulating of the students' intentions of international students. Based on the findings, the researcher rejects the null hypothesis and adopts the alternative hypothesis and concludes that there is a significant effect of social media on the intentions for international students.

H$_2$: Social media play a significant effect on the attitudes of international students' to the University

Table 4: Social Media Play a Significant Effect on Attitudes of İnternational Student's to the University

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.581[a]	.337	.335	.63333

a. Predictors: (Constant), social media

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	69.979	1	69.979	174.465	.000[b]
Residual	137.579	343	.401		
Total	207.557	344			

a. Dependent Variable: Attitude of international students

b. Predictors: (Constant), social media

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.173	.227		5.168	.000
	Social Media	.784	.059	.581	13.209	.000

a. Dependent Variable: Attitude of international students

Source: Primary data, 2022

The study on the effect of social media on the attitudes of international students to the University, the regression results provided the findings with the r-value of .581 indicating that social media has a 58.1% effect on the attitudes of international students to the University. The study shows that social media explain the attitudes of international students to the University with moderate effects, the rest of the percentage of 41.9% is explained by other factors other than social media. The standard error estimate was .63333 indicating that the data is closely related in the view of the information needed.

The findings for the study based on ANOVA results reveal that there the P-value was 0.000, since the p-value was less than the 95% confidence interval. The study indicates that social media is significant in the stimulation of attitudes of international students to the University. Based on the findings, the researcher rejects the null hypothesis and adopts the alternative hypothesis and concludes that there is a significant effect of social media on the attitudes of international students to the University.

H_3: Social media has a significant effect on international students search process for the University

Table 5: Social Media Has a Significant Effect on International Students Search Process for the University

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.584[a]	.341	.339	.60605

a. Predictors: (Constant), social media

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65.295	1	65.295	177.771	.000[b]
	Residual	125.984	343	.367		
	Total	191.279	344			

a. Dependent Variable: Student Process

b. Predictors: (Constant), social media

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.184	.217		5.454	.000
	Social Media	.758	.057	.584	13.333	.000

a. Dependent Variable: Student Process

Source: Primary data, 2022

The study on the effect of social media on international students search process for the University, the regression results provided the findings with the r-value of .584 indicating that social media has a 58.4% effect on the international students search process for the University. The study shows that social media explain international students' search process for the University with moderate effects, the rest of the percentage of 41.6% is explained by other factors other than social media.

The findings for the study based on ANOVA results reveal that there the P-value was 0.000, since the p-value was less than the 95% confidence interval, the study indicates that social media and international students' search process for the University are related. The study indicates that social media is significant in stimulating of the international students search process for the University. Based on the findings, the researcher rejects the null hypothesis and adopts the alternative hypothesis and concludes that there is a significant effect of social media on international students search process for the University.

H_4: Social media has a significant effect on international student's applications for the University

Table 6: Social Media Has a Significant Effect on International Student's Applications for the University

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.586[a]	.344	.342	.60491

a. Predictors: (Constant), social media

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65.740	1	65.740	179.659	.000[b]
	Residual	125.509	343	.366		
	Total	191.249	344			

a. Dependent Variable: Student's applications

b. Predictors: (Constant), social media

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.126	.217		5.197	.000
	Social Media	.760	.057	.586	13.404	.000

a. Dependent Variable: Student's applications

Source: Primary data, 2022

The study on the effect of social media on attitudes to international student's applications for the University, the regression results provided the findings with the r-value of .586 indicating that social media has a 58.6% effect on international student's applications for the University. The study shows that social media explain international students' applications for University with moderate effects. The findings for the study based on ANOVA results reveal that there the P-value was 0.000, since the p-value was less than the 95% confidence interval, the study indicates that social media and international students' applications for the University are related. The study indicates that social media is significant in the stimulation of international students' applications for the University. Based on the findings, the researcher rejects the null hypothesis and adopts the alternative hypothesis and concludes that there is a significant effect of social media on international student's applications for the University.

H_5: There is a significant effect of social media on the international student's choice of University

Table 7: Whether There is a Significant Effect of Social Media on The International Student's Choice of University

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.510[a]	.260	.258	.58179

a. Predictors: (Constant), social media

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.790	1	40.790	120.509	.000[b]
	Residual	116.099	343	.338		
	Total	156.888	344			

a. Dependent Variable: Student's Choice

b. Predictors: (Constant), social media

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		t	Sig.
1	(Constant)	2.032	.208		9.746	.000
	Social Media	.599	.055	.510	10.978	.000

a. Dependent Variable: Student's Choice

Source: Primary data, 2022

The study on the effect of social media on attitudes international student's choice for the University, the regression results provided the findings with the r-value of .510 indicating that social media has a 51% effect on international student's choice for University. The study shows that social media explain international students' choice for University with moderate effects.

The findings for the study based on ANOVA results reveal that there the P-value was 0.000, since the p-value was less than the 95% confidence interval, the study indicates that social media and international students' choice for University are related. The study indicates that social media is significant in the stimulation of international students' choice of University. Based on the findings, the researcher rejects the null hypothesis Ho5 and adopts the alternative hypothesis H5 and concludes that there is a significant effect of social media on international students' choice of University.

CONCLUSIONS

The study results based on the first objective conclude that social media usage plays a positive role in stimulating the intentions of international students in the selection of Universities, the study concludes that to some extent the intentions for social media development be enhanced to generate the proper generation of positive intentions by the organisation in regard to social media. On the second objective, the study concludes that there is a need for the development of social media since it can generate improved decisions by the students in terms of attitudes. The study results presented indicated that search for Universities is conducted by social media. The study concludes that the state of managerial efficiency through social media can generate effective students University searches. The fourth research question is regarding the effect of social media on international students' applications for the University. The study concludes that there is a need for stimulating social media to the students' search processes. Then finally social media has a positive effect on international students' choice of University in Türkiye. The study concludes that limited effectiveness is generated through the management of the students to generate consensus on the choice of the University in Türkiye.

RECOMMENDATIONS

The study recommends that there is a need for the development of social media to enable those with the intentions of the students, especially those intending to join the Universities have a proper way of attaining the University. There is a need for Universities to develop social media so that those with the attitude of joining the University to apply there is a need for the development of social media sites to enable and provide attractions of the people online in the bid to improve the students' attitudes to the Universities. The study on the third objective recommends that there is a need for the improvement and provision of study programs on social media that can enable effective search by the students who are in need of joining the Universities, the study provides avenues for generating the effectiveness of the sites for recruitment. There is a further need for re-development of the sites of social media in order to have them accessible, supporting courses application and evaluation so as to improve and attract more students on the online recruitments for the students. The study finally recommends that social media be developed to have programs that can support the effectiveness of the organisation in undertaking to manage the students, especially creating a situation where the applications for students are conducted online by the students in the proper and available form necessary.

LIMITATIONS OF THE STUDY

In the process of carrying out this investigation, a number of limitations might be met. These limitations may obstruct the speed at which the study is carried out.

Some targeted respondents were not willing to set aside time to respond to the investigator's questions which may end up frustrating the researcher's efforts to collect substantial data, the researcher circulated more questionnaires to attain the sample needed.

The study required a lot of time to be dedicated to collecting substantial data from one respondent to another making observations, continuous review of literature, data analysis and report writing.

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The Role of Remittances in the Economic Development of Cameroon

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ABSTRACT

The old world and more importantly the 21st century is strongly characterized by the exchange and movement of people, goods, and even services. When countries or institutions discuss free trade issues at length, it is certainly because they have gauged the economic benefits that will result from it. Immigration is as old as time itself but will experience a particular breakthrough thanks to the industrial revolutions. One of the direct consequences of such activities is the transfer of funds. With the growth and flow of remittances in the world, we will in this work examine the situation of remittances in Cameroon. Our main objective in this study will therefore be to survey the statistics on remittances in Cameroon, but more importantly to highlight the role they play in the country's economic development.

Keywords: *Remittances, Economic Growth, Immigration, Cameroon.*

Remittances have been growing for decades and have called the attention of researchers, policymakers, and international financial institutions such as the International Monetary Fund (IMF) and the World Bank. Remittances are transferred from high-income countries considered immigration pools to lower-income countries representing emigration pools. They refer to money sent by migrants to their countries of origin, either to their families back home, or to the creation of lucrative activities on behalf of the migrants, or savings banks with the whole diaspora to carry out infrastructure and sustainable development projects. "Private transfers are a blessing for those who receive them" (Chami and Fullenkamp, 2013). They increase the income of recipient families by enabling them to cover their basic needs (food, clothing, health, and education). They also contribute to lowering the poverty rate.

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They allow some families to escape poverty by allowing them to spend more than what they receive as wages. In addition, remittances may make recipient households less active, allow them to work less, or engage in high-risk projects that they would not undertake if they did not receive remittances.

Migrants' remittances to their countries of origin constitute considerable financial manna and crucial financial support that contributes to increasing the income of the recipient families. Thus, they represent the most significant element of the relationship between migration and development. These remittances are not only considered financial transfers, but also as social transfers. Moreover, they represent an important source of financial flows for the recipient countries.

As an indication, in 2011, they represented 10% of the GDP of 22 developing countries. Moreover, they are stable, counter-cyclical, and resilient in the face of adverse business conditions.

According to calculations and statistics, in 2006 transfers of funds from migrants to developing countries reached 228 billion USD. They represented the second-largest source of financing for these countries after foreign direct investment (FDI) and ahead of official development assistance (ODA). In 2007, 2008, and 2009, remittances reached $278 billion, $323 billion, and $307 billion respectively. These figures show that remittances are resilient even in times of recession and economic crisis. Remittances decreased slightly in 2009 but have increased again since 2010. In recent years, remittances have increased remarkably. They reached US$453 billion in 2015, are now higher than FDI and ODA (excluding China) and represent the largest source of external financing for low- and middle-income countries.

For example, the World Bank reports that despite the impact of the coronavirus on most economies, including a global recession unprecedented since 1945, many experts predicted that remittances would take a hit and slow down. Contrary to those expectations, remittance flows held up surprisingly well in 2020, even reaching $706 billion in total, up from $722 billion in 2019, the World Bank estimated, and are expected to rebound in 2021 to $751 billion.

According to the World Bank's 2011 Factbook on Remittances and Migration, remittances played a very important role during the crisis by providing a safety net for poor countries in the face of the collapse of private capital flows. According to the Factbook (2011), the top 10 countries of destinations for migrants were the United States, Saudi Arabia, Germany, Russia, the United Arab Emirates, the United Kingdom, France, Canada, Spain, and Australia. On the other hand, the top 10 countries of origin of migrants were India, Mexico, Russia, China, Bangladesh, Pakistan, Philippines, Afghanistan, Ukraine, and the United Kingdom. In addition, the Mexico-U.S. borders were the world's largest migration corridor in 2013 (13 million migrants) followed by the Russia-Ukraine, Bangladesh-India, and Ukraine-Russia corridors. The United Nations considers the last three South-South corridors.

Therefore, it can be safely said that developing countries are the main beneficiaries: in 2010, 73.9% of these financial flows went to them, or $325 billion. International remittances are thus the second-largest source of external financing for developing countries, after foreign direct investment.

However, while there is a great deal of research, both theoretical and empirical, on these financial flows, the framework of the study is very often limited to remittances made by migrants who have emigrated to developed countries. In contrast, few studies focus on South-South remittances between developing countries. Yet 43 per cent of international migrants from developing countries reside in another developing country (World Bank, 2010). Moreover, in 2010, 43.7 million people were forced to migrate because of armed conflict or persecution (20.4 per cent of international migrants). Of these, 80 per cent chose a developing country as their host country (Unhcr, 2011). Thus, while international migrants to industrialized countries are largely individuals who move by choice, particularly to take advantage of better economic opportunities in the host country, many migrants moving within developing countries do so under duress, to escape political instability, persecution, or natural disasters. In the first case, migration is described as "voluntary" while in the second case it is more akin to "forced" migration. The difference in the nature of the migration can therefore lead to different remittance behaviors.

These differences in behavior depending on the migrant's departure status (voluntary or forced) are little studied in the literature (Fagen and Bump, 2006; Van Hear et al., 2009), which tends to focus on the behavior of voluntary migrants.

The economic crisis that hit Cameroon, as well as the majority of developing countries south of the Sahara in the 1980s, was at the origin of a rise in economic emigration alongside that of study, observed during the post-independence period. In this context of crisis characterized by the disengagement of the state from its regalian functions (education, health, etc.), high unemployment, a lack of prospects, and continuous deterioration in the living conditions of the population, emigration constituted, the individual and family levels, a strategy for diversifying sources of income given the prevailing situation of uncertainty, and remittances constituted the main bridge linking migrants to their country of origin (Kamdem, 2007; Guilmoto and Sandron, 2003).

Remittances in Cameroon, however, are generally intended to meet needs such as food, education, housing, and health care (Kamdem, 2007, Tchékoumi, 2008, Schmelz, 2007). Thanks to their countercyclical effect on the economy, i.e., increasing during periods of recession and decreasing during periods of expansion, transfers help recipient households maintain their level of well-being and to better distribute their consumption expenditures over time, especially for those who practice seasonal activities such as farmers (Daffé, 2009).

Looking at the background, from this study, therefore, we will trace the flow of remittances in Cameroon, investigate what they are used for, and then determine the role these remittances play in the economic development of Cameroon.

LITERATURE REVIEW

The literature relating to the transfer of funds in the world, to Africa, and more precisely to Cameroon is extremely rich. Generally, migrants who move to settle and work in developed countries have four main reasons for transferring funds: either to ensure the survival and well-being of their families back home, for personal investment, for generosity and sharing, or because of an informal contract between the travel funder and the traveler (case of repayment of debts) or for all these reasons.

Remittances have a positive impact in terms of providing an important source of additional income for many households (Zourkaléini et al., 2013). The works of (Kamdem, 2007; Schmelz, 2007), will largely support this idea since they believe that the main purposes of these remittances are for cases of illness and death occurring locally as well as participation in the schooling of siblings and other family members, since the standard of living of the populations, in general, is still quite low. This is why (Lerch, 2006) asserts that "transfers also make it possible to ensure a certain degree of social mobility and the maintenance of rural and community roots, thanks in particular to a more "decent" economic transition.

For (Kamdem, 2007; Guilmoto and Sandron, 2003) on the other hand, a strategy of diversification of income sources given the situation of uncertainty prevailing in Africa and Cameroon (unemployment, low salaries, and inactions of public decision-makers), and remittances constituted the main bridge linking migrants to their country of origin.

The repayment of funds previously used to finance the migrant's trip is not insignificant in terms of reasons for remittances. In Africa in general and in Cameroon in particular, parents through "tontines" (loans from meetings and associations) usually make huge loans to finance their child's study/travel project. The fact that this child pays back the money later is considered a success and social ascension. Indeed, "in the rural world, he becomes a local notable whose opinion on various issues is sought by family and tribal members, and he is frequently asked to prepare the departure of other family members" (Khachani, 2009: 213). In addition to "noble" titles (Mimche, 2009), economic investment opportunities are a source of motivation for the migrant to send remittances. This way of operating opens up what we call a "pull-up process", with the first traveler having to succeed, to bring up his other brothers, or create wealth so that they can live comfortably.

Status of Remittances in Cameroon

In a study conducted in 2020, entitled "Evaluation of Development Financing [DFE] in Cameroon" and financed by the United Nations Development Program (UNDP), it emerged that, compared to countries such as Ghana, DRC, Ethiopia, Kenya, Mali, Senegal, South Africa or Tunisia, the Cameroonian diaspora contributes very little to the financing of the national economy.

The same report reveals that in a country like Ghana, the number of financial flows received from the diaspora, in the form of current transfers, increased in 2017 to 3,536 million dollars (a little more than 2,000 billion FCFA) while in the same year, Cameroon received only 316 million dollars (about 185 billion FCFA).

In the same vein and over the same study period, current transfers represented 13% of GDP in Comoros, 10% of GDP in Senegal, 8.45% in Togo, 6% in Ghana, 7% in Mali, and only 0.9% of GDP in Cameroon.

The UNDP will therefore affirm that this phenomenon confirms the need to conduct studies to identify the determining factors of remittances and the channels through which these transfers are channeled.

“The low involvement of the Cameroonian diaspora in the development of the country, therefore, deserves to be addressed through in-depth studies ranging from the evaluation, even if only approximate, of its savings potential, to the search for specific instruments that can encourage Cameroonians living abroad to invest more in their country of origin,” suggests the report.

UNDP suggested that local authorities should be more involved in all initiatives and other platforms for dialogue with the diaspora so that the diaspora can present them with local development projects that would benefit not only Cameroon as a whole but also their families and relatives living in remote corners of the country.

For better statistics, Cameroon’s remittances to GDP (%) were 0.85339% in 2020, according to the World Bank’s collection of development indicators, compiled from officially recognized sources. Cameroon - Remittance flows to GDP - actual values, historical data, forecasts, and projections from the World Bank as of March 2022. The table below shows the contribution of remittances to GDP in Cameroon between 2010-2020.

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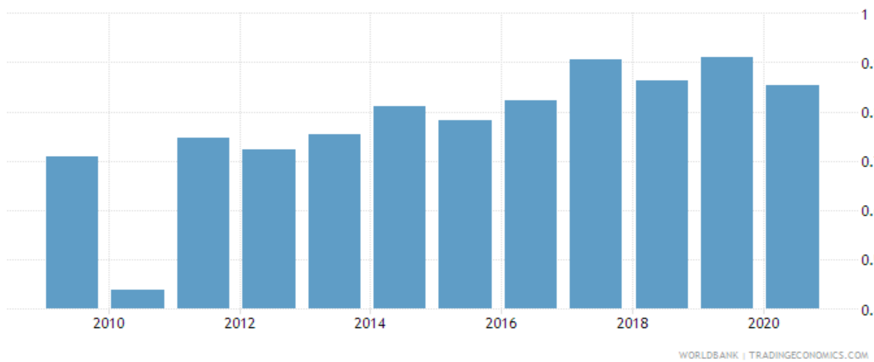
Figure 1: Remittance Inflows to Cameroon's GDP (2010-2020)



Source: World Bank

As the table shows, the flow of remittances to Cameroon was 0.7 in 2010 but will fall later in 2011 to 0.4. Later (2018) it will rise (0.9) and then drop again slightly in 2019 (the reasons may be the coronavirus). In 2020 it even exceeded 0.9 before falling again in 2021.

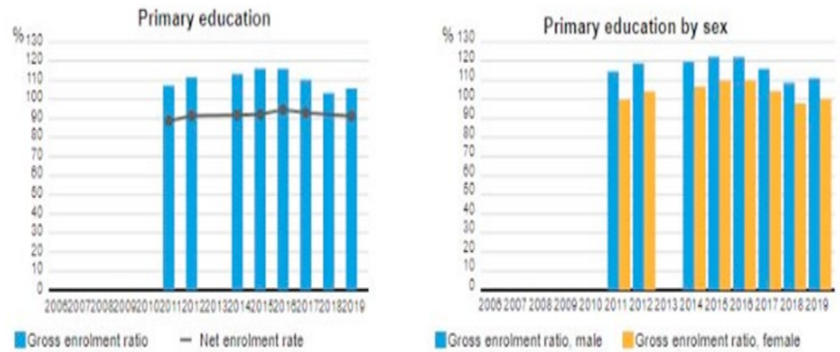
The Distribution of Remittances in Cameroon

Even when one knows what remittances are directly used for or their real motives, one can always wonder at what rate or percentage a given motive

is valued. The use of remittances generally varies from one country to another depending on priority needs. While most countries often use remittances for daily consumption, others prioritize health and education, the creation of jobs and infrastructural projects, or simply personal savings. Remittances has contributed to the educational sector of Cameroon.

The following tables from the work of UIS UNESCO, present Gross enrolment ratios for education in Cameroon.

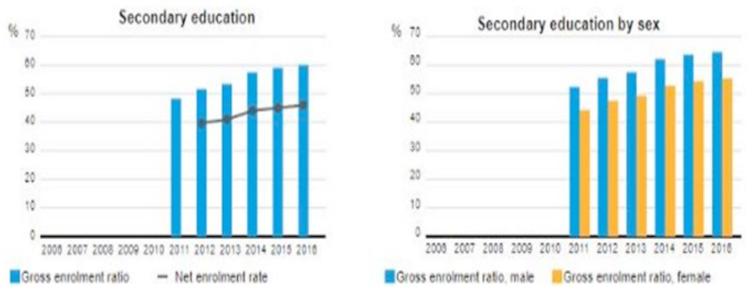
Figure 2: Gross Enrolment Ratio for Primary Education in Cameroon



PRIMARY EDUCATION	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gross enrolment ratio (%)										
Total	107.23	111.67	...	113.28	116.21	116.12	110.32	103.4	105.75	...
Female	99.69	104.26	...	106.7	109.94	109.99	104.51	98.01	100.21	...
Male	114.66	118.97	...	119.77	122.39	122.16	116.05	108.71	111.2	...
Net enrolment rate (%)										
Total	88.7	91.4	...	91.7	92.1	94.5	92.9	...	91.2	...
Female	82.9	...	...	...	...	90.3	88.7	...	86.8	...
Male	94.5	...	...	...	...	98.7	97	...	95.6	...

Source: UIS/UNESCO

Figure 3: Gross Enrolment Ratio for Secondary Education in Cameroon



SECONDARY EDUCATION	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gross enrolment ratio (%)										
Total	48.32	51.59	53.41	57.51	59.03	60.06	..	..	..	..
Female	44.23	47.53	49.21	52.83	54.4	55.44	..	..	..	..
Male	52.37	55.6	57.56	62.14	63.62	64.62	..	..	..	..
Net enrolment rate (%)										
Total	..	39.7	41	44	45	46	..	..	..	..
Female	..	37	38.2	40.9	42.1	43	..	..	..	..
Male	..	42.3	43.8	47	47.9	48.9	..	..	..	..

Source: UIS/UNESCO

Figure 4: Gross Enrolment Ratio for Tertiary Education in Cameroon

TERTIARY EDUCATION	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Gross enrolment ratio (%)										
Total	12.1	13.1	15.3	16.3	17	12.5	12.8	14.3	..	..
Female	10.2	11.4	13.3	14.3	15.1	11.7	11.4	13.4	..	..
Male	13.9	14.8	17.2	18.3	18.8	13.3	14.1	15.1	..	..

Source: UIS/UNESCO

According to Herbert Fambeu (2015), a researcher at the University of Douala remittances has contributed positively to education in Cameroon.

Rremittances increase the probability of being in school for both boys and girls. This impact of remittances on girls' schooling is greater for girls in higher education (university) (18-25 years old).

Remittances' Contributions to House Construction, Plot Purchase, and Creation of Businesses

In an article entitled ''L'argent de la diaspora et le financement des infrastructures Sociales urbaines et périurbaines de base en Afrique'' (Diaspora money and the financing of basic urban and peri-urban social infrastructure in Africa), Tchouassi and Sikod (2010) demonstrate the origin of funds linked to infrastructure development in Cameroon.

The successes or positive effects of remittances should not obscure the fact that some negative effects should not be ignored. Some studies suggest that remittances have negative economic impacts. For example, Catrinescu et al (2009) highlight some of the adverse effects of remittances, which include exchange rate appreciation, increased inequality, loss of competitiveness, moral hazard, and low labor market participation of recipients. Similarly, remittances appear to foster corruption (Ahmed, 2013; Berdiev et al., 2013; Abdih et al., 2012).

Unlike Foreign Direct Investment (FDI), which is intended for investment, remittances are mostly spent on consumer goods and the purchase or construction of houses. In this case, remittances have no positive effect on the economic growth of the migrants' countries of origin. Chami and Fullenkamp (2013) find that the results of studies on the impact of remittances on economic growth are not clear-cut, as the results depend on how the remittances are used by the recipients.

However, the state also benefits from this financial windfall and could use it more for the country's growth. The study by Abdih, Chami, et al 2012) revealed that the state benefits from remittances that are destined for the consumption of local or imported goods, and which contribute to the increase in the tax base through VAT and import duties, which allows the state to reduce taxes and/or increase public spending. Thus, the impact of transfers depends on their use by recipient households, and also by the government, which benefits from a higher level of indebtedness to finance its investments.

However, other studies find that remittances have no positive effect on economic growth and could make the situation worse. For example, the study by Abdih, Barajas, et al. (2012) finds that remittances allow the state to have more resources through the tax base, redistribute these resources to those in power, and promote corruption within state institutions.

Nwajiaku, Profos, et al. (2014) assume that transfers are spent more on consumption and make recipient households still dependent.

METHODOLOGY

To come up with a better way to attend our goals, the research adopted a methodology that gathers and address the tools of data collection, discuss data collection and consequently their analysis. The study used participants and questionnaires to approach the data assembled.

Data Collection

Participants

Our study being typically oriented on the questions of growth Vis a Vis remittance, we had for participants exclusively Cameroonians living in different Diasporas, namely Turkey, the United States of America, England, France, Latvia... In total, 60 Cameroonians with quite varied profiles took part in this research exercise. The result will be exposed below.

Questionnaire

Another important fact about this article is that we conducted our research remotely. The questionnaire consisted of two parts: the first part was devoted to the respondent's information (age, sex, country of residence, number of years abroad, reason for moving, professional status, etc.) and the second part was devoted to the attitudes or behavior of Cameroonians in the diaspora with regard to remittances (reason for sending, channel of sending, frequency of sending, source of money, preference for rate of sending, reason for discouragement etc.).

Data Analysis

The analysis of the data will consist in faithfully reporting the content of the information received from our 60 respondents. First, we will present the results of the informants' profile before we unpack the section on remittances in Cameroon.

Background of Informants

As mentioned above, part 1 is devoted to the profile of the informants (age, sex, country of residence, and professional situation).

Table 1: Background of the Informants

Gender	**Male**			**Female**		
	32 (53.3%)			28 (46.7%)		
Age	18-29	30-39		40-49	50+	
	23 (38.3%)	21 (35%)		13 (21.7%)	3 (5%)	
Where do you live?	**Abroad**			**Cameroon**		
	55 (91.7%)			5 (8.3%)		
Specify the country	**Turkey**	**England**	**Belgium**	**USA**	**France**	**Latvia**
	33 (56.9%)	8 (13.8%)	1 (1.7%)	10 (17.2%)	5 (8.6%)	1 (1.7%)
For how long have you been abroad?	**Less than 5 years**	**5-10 years**	**10-20 years**	**20+**		
	22(36.7%)	24 (40%)	10 (16.7%)	4 (6.7%)		
Level of education	**Primary school**	**Secondary education**	**University level**	**Training school**		
	6 (10%)	7 (11.7%)	35 (58.3%)	12 (20%)		
Working status	**I am a worker**	**I am jobless**	**I am retired**			
	34 (56.7%)	22 (36.7%)	4 (6.7%)			

Are you a student?	Yes	No
	34 (56.7%)	26 (43.3%)

From the information in this table, it is clear that the majority of our respondents were men (53.3% versus 46.7% for women). Also these respondents were mostly young as 38.3% were between 18-29 years old, 35% between 30-39 years old, 21.7% between 40-49 years old and just 5% who were 50+.

Naturally, the majority of our informants (91.7%) are settled outside Cameroon and since this study is conducted in Turkey, it is not surprising that our respondents (56.9%) are residents in Turkey against 13.8% in England, 10% in the USA, 8% in France, 1.7% in Belgium and 1.7% in Latvia.

These informants have more or less different experiences in terms of the number of years they have spent in their host country. Most of them (40%) have been living outside Cameroon for 5-10 years, while 36.7% have been living there for less than 5 years, 16.7% for 10-20 years and 6.7% for more than 20 years.

It must be said that most of our informants are educated, as 58.3% of them were university graduates, 20% have followed or are following a vocational training, 11.7% have not gone beyond the secondary school level, and 10% have not gone beyond the elementary school level. On the other hand, of our 60 informants, 56.7% are workers, 36.7% are not workers and 6.7% are retired. Therefore, 56.7% of the informants are students and 43.3% are not.

Remitters' Attitudes

Here, we set out to expose the attitude or behavior of remitters in Cameroon.

Table 2: Remitter's Attitudes

No 1	I am living abroad for :				
Work	Studies	Insecurity in my country	I come from a mixed family		
20 (33.3%)	26(43.3%)	10 (16.7%)	04 (6.7%)		
2	I transfer money to the country				
A little too much	Always	Rarely	Never		
17(28.3%)	23(38.3%)	17(28.3%)	03 (05%)		
3	I send the money for:				
Children's education	Health issues	Daily needs	Building/ business projects	None of the above	All of the above
07 (11.7%)	10 (16.7%)	18 (30%)	07 (11.7%)	05 (8.3%)	13 (21.7%)
4	Without this money my family will not be able to live comfortably				
Strongly agree	Agree	Strongly disagree	Disagree		
19 (31.7%)	20 (33.3%)	11 (18.3%)	10 (16.7%)		
5	My family or loved ones need this money because				
Low wages	They are unemployed	Cases of force majeure beyond their control	Stereotype i.e. they think there is a lot money abroad	None of the above	
17 (28.3%)	17 (28.3%)	15 (25%)	03 (5%)	08 (13.3%)	

Table 3: Remitters' Attitudes

6 Since I live abroad, I do not see the need to send money to Cameroon

Strongly agree	Agree	Strongly disagree	Disagree
5 (8.3%)	3 (5%)	29 (48.3%)	23 (38.3%)

7 I stopped sending money to Cameroon because it was making my family dependent on me.

Strongly agree	Agree	Strongly disagree	Disagree
05 (8.3%)	18 (30%)	18 (30%)	19 (31.7%)

8 The sending costs are too high and this discourages

Strongly agree	Agree	Strongly disagree	Disagree
08 (13.3%)	29 (48.3%)	8 (13.3%)	15 (25%)

9 I send money via :

Western union	Money gram	World remit	Ria	Send wave	Taptap send	None
14 (23.3%)	13 (21.7%)	10 (16.7%)	10 (16.7%)	1 (1.1%)	3 (5%)	9 (15%)

10 These transfers helped me set up lucrative activities

Yes	No
39 (65%)	21 (35%)

11 It is thanks to these transfers that I have a house in my country

Yes	No
31 (51.7%)	29 (48.3%)

Table 4: Remitters' Attitude

No 12 What is the origin of the money you transfer?

My work	My student job	Personal savings	Financial aids
27 (45%)	13 (21.7%)	20 (33.3%)	00 (00%)

13 Sending money to your relatives for various reasons helps to develop the economy of Cameroon

Strongly agree	Agree	Strongly disagree	Disagree
25 (41.7%)	25 (41.7%)	3 (5%)	7 (11.7%)

In order to carry out our research on the role of remittances in Cameroon's economic development, it was crucial for us to understand the attitudes of remitters.

Thus, we first asked them the reason for their migration; the majority 26 (43.3%) moved for studies, 20 of the informants (33.3%) for work, 10 (16.7%) because of the insecurity that threatens their countries and 4 (6.7%) because they come from mixed families. This question is important because we believe that remitters' attitudes will vary depending on their reasons for moving.

Also, of our 60 informants, 23 (38.3%) say they always send money to Cameroon, 17 (28.3%) say they do so a little too much, 17 (28.3%) say they rarely do so, and 03 (5%) say they never do so.

But what motivates remitters? Ten of our informants (16.7%) send money to Cameroon for health problems, 18 (30%) for basic needs, 07 (11.7%) for schooling, 07 (11.7%) for infrastructure projects or business, 13 (21.7%) for all of these reasons and 05 (8.3%) for none of the reasons mentioned. Consequently, 19 out of 60 informants (31.7%) strongly agreed that without these funds their families back home would not be able to live comfortably, compared to 20 (33.3%) who agreed, 11 (18.3%) who strongly disagreed, and 10 (16.7%) who just disagreed.

But why do these family members back home need the money? Our informants have various opinions; 17 (28.3%) think it is because their family members have low salaries, 17 (-28.3%) think it is because of lack of employment, 15 (25%) say they need it for circumstances beyond their control, 03 (5%) think their family members are just being parochial and think that money is easier to find abroad and finally 08 (13.3%) who do not take part in any of the reasons mentioned.

When we further assumed that our informants did not need to send money to Cameroon since they are already settled abroad, the minority agreed 11 (13.3%) versus the majority 52 (86.6%) who either strongly disagreed or just disagreed.

When we further assumed that our informants did not need to send money to Cameroon since they are already settled abroad, the minority agreed 11 (13.3%) versus the majority 52 (86.6%) who either strongly disagreed or just disagreed.

If the minority (8.3%) for those who strongly agree and 30% for those who agree, think that sending money makes the family dependent and lazy, the majority (30%) for those who strongly disagree and 31.7%) for those who disagree think otherwise.

Similarly, this same majority (13.3%) for those who strongly agree and 48.3%) for those who agree, think that the cost of sending money to Cameroon is high against a minority of 13.3% for those who strongly disagree and 25% who disagree.

They usually transfer these monies through the multiple channels of money transfers and receipts that have emerged over the past few years. Of our 60 informants, 14 (23.3%) use the traditional Western union, 13 (21.7%) money gram, 10 (16.7%) world remit, 10 (16.7%) RIA, 3 (5%) Taptap send, 1 (1.1%) send wave and 9 (15%) use neither of these channels.

Also, 39 (65%) of these informants versus 21 (35%) state that these remittances allow them to engage in income-generating activities. Better yet, 31 (51.7%) said they had built a house in Cameroon thanks to these remittances, compared to 29 (48.3%) who had not built thanks to these remittances. Further on, when asked about the origin of our informants' funds, 27 (45%) report that they got them from their work, 20 (33.3%) say that they got them from their personal savings, and 13 (21.7%) report that they got

them from their student jobs.

Of the 60 informants, 25 (41.7%) strongly agree that remittances help develop the country's economy, 25 (41. 7%) agree that remittances facilitate Cameroon's economic development, yet a minority 3 (5%) strongly believe that remittances play no role in Cameroon's economic growth and 7 (11.7%) simply disagree that remittances promote Cameroon's economic growth.

These results will be discussed in depth in relation to our problematic, our research questions and our hypotheses in the following chapter.

CONCLUSION

We scrutinized the role of remittances in the economic development of Cameroon". Our objective was to survey the statistics on remittances in Cameroon, but more importantly to highlight the role they play in the country's economic development, and this is why the problem of this research was: What is the role of remittances in the economic growth of Cameroon?

Indeed, remittances in Cameroon, according to our results, allow for an increase in the level of human capital of the members of the recipient households. Remittances ease the credit constraints of the households that receive them and thus promote higher human capital by delaying school dropout, improving the quality of education and the health of individuals. Better still, these remittances have a real role in job creation and infrastructure development. Also, the effect is only visible on members of poor and middle-income households.

Int terms of recommendations, we propose to the government of Cameroon the following: promote a conducive environment to ease the sending of funds by migrants; to setup strong institutions to fight all form of corruption and fraudulent activities; double their spending on key infrastructural projects such as roads, schools and hospitals. To money transfer agencies and banks, we propose conditions of sending and receiving money should be moderate. To remitters, we suggest that the money sent must be used for valid reasons, with the aim of promoting economic growth.

For future researchers, the issues of money transfer and economics will always be relevant because a country is strong by virtue of its economic growth. There is therefore a need to continue to explore this area in order to contribute to the economic literature of the country and to propose solutions.

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