

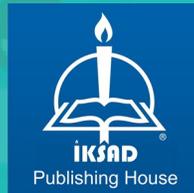
RETHINKING MANAGEMENT, ECONOMICS AND MARKETING PROCESSES



EDITORS

Assoc. Prof. Dr. Barış AYTEKİN

Assoc. Prof. Dr. Aliye AKIN



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Assoc. Prof. Dr. Barış AYTEKİN

Assoc. Prof. Dr. Aliye AKIN

AUTHORS

Assist. Prof. Dr. Ahmet GÜMÜŞ

Assist. Prof. Dr. Fatma Özgü SERTTAŞ

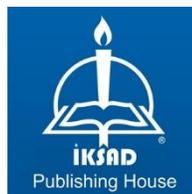
Assist. Prof. İsmail ÖZDEMİR

Assist. Prof. Dr. Nilüfer RÜZGAR

Assist. Prof. Dr. Rabia YILMAZ

Lec.Dr. Mehmet Ozan KARAHAN

Davut ULUÖZ



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PREFACE

In the journey from the classical economic approach to the present, important changes have emerged in the theory of production. At the very beginning of industrialization, economic thought revealed a production function depending on a single production factor. In this case, subjects such as the role of the entrepreneur, the importance of the business organization, the market structure and demand function, the productivity of the workforce and the working style cycle, business finance and capital market were mostly not included in the production organization and function.

Modern economies, on the other hand, are constantly changing and transforming into new forms as both supply and demand elements gain importance. In this process, while defining the production function, both the quantitative and qualitative dimensions of the factors of production have changed considerably. In addition, the management function of enterprises can be considered as a special factor. In addition, the markets have diversified significantly. While the demand factor came to the fore, the macroeconomic factors affecting the financing dimension of the enterprises gained importance.

In this book, the said dimension of the emerging change is discussed under different headings. These can often be highlighted as a balance and efficiency issue in relation to the management issue in the production process. Business behaviors that negatively affect productivity, and the structure of leadership management are the issues that affect the management function and production process in this context. On the other hand, change presents a chaotic structure today. While flexibility gains importance in this environment, it is also important that management systems be in a way that can adapt to a large number of variables. In addition, work-life balance is at the center of the productivity problem in modern economies. In this respect, the productivity of the workforce also depends on the social life outside of working hours. It is necessary to change the market structure and accordingly to reconsider the marketing models, and the need for new methods for the evaluation of market data is increasing.

The book named " Rethinking Management, Economics And Marketing Processes" consists of six chapters. We hope that the book will contribute to the world of science and be a source for future studies. We would like to thank all the academicians who contributed to this book, and the staff of IKSAD Publishing House who worked hard to publish the book.

December, 2022

Assoc. Prof. Dr. BARIŞ AYTEKİN

Assoc. Prof. Dr. ALİYE AKIN

CHAPTER 1

**THE EVALUATION OF CHAOS AND COMPLEXITY
THEORIES IN TERMS OF ORGANIZATIONAL
MANAGEMENT**

Assist. Prof. Dr. Rabia YILMAZ ¹

¹Selcuk University, School of Civil Aviaation, Department of Aviation Management,
Konya/Turkey, rabia6591@gmail.com, orcid id: 0000-0003-1335-2462

INTRODUCTION

The development of management scientifically begins with the classical management theory, which discusses the organization formally (Kitana, 2016: 17). However, the changes in the paradigm that emerged in recent years have revealed the post-modern management theory, which considers everything relative and deals with the practices necessary to prepare for an inevitable future (Koçel, 2014: 407; Genç, 2017: 134). Chaos and complexity theories, which have a crucial role in post-modern management theory, were first used in natural sciences. Then these theories began to be used in the field of social sciences. In fact, chaos and complexity theories are a continuation and complementary for the general systems theory (Mitleton-Kelly, 2003: 43). General systems theory in management is a theory that deals with management events in the organization and the relations between the units with each other where these events take place. In this direction, according to this theory, if managers provide coordination between units and employees, they can achieve organizational objectives (Robbins et al., 2013: 35). Especially the globalization and technological changes brought by today, the increase in the value to human beings and the development of a holistic system approach have further increased the use of chaos and complexity theories for organizations (Koçel, 2014: 563). According to some researchers, chaos and complexity have offered a different perspective in the study of social systems, and the similarities and subjects discussed by these theories in the field of management and organization have changed the opinions of managers and employees to a large extent (Akçin & Zengin, 2020: 1308; Tekel, 2006: 224; Cooksey, 2001: 77).

Organizations can constantly be in a chaotic environment. For organizations, it is necessary to take measures against instant changes in a short time and to respond immediately to the created by the chaos process (Wilding, 1998: 46; Mercan et al. 2013: 125). In this sense, the managers need to convert a chaotic situation in the interest of the organization in the light of chaos theory without being lost in this environment. It is inevitable for organizations to be in complex situations. There are non-linear relationships between individuals and

functions in the organization. In this direction, it is hard to provide effective communication for individuals, functions, and departments. In this case, the managers must act correctly and adapt to the change immediately (Allen et al., 2011: 526). In this sense, managers should make the best decisions for the organization by correctly using the characteristics of complexity theory.

Organizations are actually living and dynamic systems. In this direction, all kinds of relationships with an organization will be non-linear. Change in these relationships is inevitable. The success of organizations will increase through dynamic reactions during change (Çıraklı et al., 2017: 339). In this case, organizations that act within the scope of the chaos theory with rules and repetitions, and the complexity theory with adaptability, will respond more quickly to these changes and reactions and will be one step closer to achievement (Sayğan, 2014: 418).

The other parts of the study are organized as follows: In part one and two; chaos and complexity theories are examined within a conceptual framework. In part three; it is attempted to investigate the difference between these two theories. In part four; chaos and complexity theories are evaluated within the framework of organizational management. In part five; at the end of the study, a general evaluation is carried out, and suggestions are made.

1. CHAOS THEORY

According to Goldstein (2015), when saying chaos, the first words coming to mind are disorder, confusion, randomness, and instability (Mbengue et al., 2018: 3). However, in today's sciences, including social sciences, chaos specifically refers to the order of disorder (Gleick, 2005: 17; Pryor & Bright, 2011: 51). According to Lorenz (1995: 8), the concept of chaos is a sensitive dependence on initial conditions (Juárez, 2016: 356).

Lorenz (1961), a mathematician, has a crucial role in the emergence of chaos theory (Uçar, 2015: 295). With the use of chaos theory in the social sciences field, the complexity of social phenomena could highly be understood (Biçici, 2016: 34). In fact, chaotic

environments create chaotic dynamical systems. Especially, organizations are fed with these systems (Sellnow et al., 2002: 270; Bayaga et al., 2017: 52). Because chaotic dynamic systems interact with the internal and external environment, they always expose to several effects. However, it is difficult to transparently determine what the consequences of these effects will be, especially in a chaotic environment, and the changes that occur are not linear (Pryor & Bright, 2011: 104; Sellnow et al., 2002: 270; Bayaga et al., 2017: 50). However, sometimes, any random behavior within systems can be predicted. In this direction, situations experienced in the past can be expressed more clearly in time. However, a phenomenon that occurs in the system may not be replicated in the future. Nevertheless, this phenomenon may reoccur in certain circumstances (Bright & Pryor, 2005: 292; Wilding, 1998: 46).

In chaos theory, an insignificant change in the system may lead to massive changes in other parts of the system. Because the organizational system is non-linear, massive changes may have a more or less profound effect over a long time. However, this situation cannot be fully predicted (Bright & Pryor, 2011: 165). In this sense, apart from the cause and effect relations in chaos theory, the order of disorder occurs with the consequences of the reflections of repetitive situations and events (Akçin & Zengin, 2020: 1311). In other words, this theory states nonlinear dynamics with constant repetition (Güney, 2020: 236). From a different viewpoint, chaos theory is about the existence of events whose progress and outcome are almost impossible to predict, and the view that the relations between the factors that occur while these events emerge and result are very precise and unpredictable, and finally about how this situation highly affects each other (Güney, 2020: 236; Sellnow et al., 2002: 270).

Chaos theory has several characteristics, and these characteristics also have an effect on organizational management. It can be listed as follows: (a) Butterfly effect; according to some researchers, it can be expressed by changing the results of the system depending on the conditions that first appeared in a system. This situation is mostly related to “sensitive dependence on initial

conditions” (Kılıç, 2010: 33; Öztürk & Kızılkaya, 2017: 261). A small impact may lead to big results in organizational management. (b) Bifurcation; is related to the sudden systematic change coming with the chaotic environment (Laszlo, 2004: 51). (c) Self-organization; is related to the self-coordination and regulation of systems in chaos for some researchers (Farazmand, 2003: 351; Lartey, 2020: 46). (d) Fractals; are about complex systems that consist of being in a state of interdependence (Murphy, 1996: 100; cited in Lartey, 2020: 46; Gleick, 2014: 122). (e) Strange attractors; are about one structure of the system moving another structure towards itself and creating an implicit order in a chaotic environment (Gleick, 2014: 122; Thietart & Forgues, 1995: 21; Purworini et al., 2019: 37).

2. COMPLEXITY THEORY

When saying complexity, the first thing that comes to mind is situations and reactions that occur when the agents or necessary processes affect each other (Johnson, 2009: 3). In fact, complexity is not only about the ability to react in a certain way to any situation or event but also about the ability to react differently in many respects (Allen, 2001: 150; as cited in Sayğan, 2014: 413).

The investigation of complexity theory first started in 1984 with the studies of researchers from different disciplines at the Santa Fe Institute in California (Fisher et al., 1987; as cited in Çelik & Polat, 2018: 1324). Complex systems are those having specific internal integrity and consist of many components. These components have a strong interaction within the system. Every single component in the system can affect each other due to this interaction. As a result, the components can restructure, create and adapt themselves to the environment (Çelik & Polat, 2018: 1325; Tüz, 2001: 5). In this case, complexity theory expresses the change, transformation, and development in dynamic systems rather than predictable or repetitive behaviors (Tekel, 2006: 225). Not possible to talk about a definite or stable state in complexity theory (Özen & Turan, 2017: 69). In other words, according to Koopmans (2016), this theory results from the interaction between the components of a system, as well as the

interaction between the system and its components as a whole, in an unpredictable process (Mbengue et al., 2018: 5; Smith & Humphries, 2004: 103). In this direction, complexity theory states that systems form a unique, unpredictable and interactive structure consisting of small parts and combinations of units (Kiel, 1993: 144; Ercil, 2016: 412). Finally according to Stevens and Hasset (2007: 128), complexity theory is necessary to understand complex systems better (Çelik & Polat, 2018: 1325).

Unlike conventional thinking methods, complexity theory encourages people to evaluate events from a different point of view (Lewin, 1999: 10). This theory focuses on the whole rather than the parts. In addition according to some researchers, relationships, open systems, and environment are vital in this theory (Bryne, 1998: 66; Cochran-Smith et al., 2014: 106). In this sense, it is almost impossible to know when and how severe the next problem will occur, even if a wide range of studies are carried out, and predictions are made about the problems that a system (or organization) may experience in the future (Coveney & Highfield, 1995; Turner & Baker, 2017: 2). In this case, complexity theory states that it is a mistake to make assumptions. This theory is also about why it is impossible to predict the outcome exactly (Coveney & Highfield, 1995). In addition, some researchers have emphasized the importance of complexity theory in how complex systems regulate uncontrolled or undirected interactions between specific agents (Turner & Baker, 2017: 2).

The basic characteristics of complex systems can be listed as follows: (a) Emergence; according to some researchers, this characteristic is related to new structures, components, and behaviors that emerge spontaneously as a result of several interactions (Lartey, 2020: 46; Rhodes et al., 2011: 13). (b) Self-organization; is the natural emergence of the new order without any internal and external intervention and pre-design (Hudson, 2005: 17). (c) Nonlinearity; complex systems are dynamic. Therefore, complex systems are unpredictable. This situation reveals non-linear relationships (Schneider & Somers, 2006: 355; as cited in Lartey, 2020: 46). (d) Co-evolution; is the reaction of the other system to the change in one of the two

different systems and the evolution of a mutual effect between different systems (Mitleton-Kelly, 2011: 49).

3. DIFFERENCE BETWEEN CHAOS AND COMPLEXITY THEORIES

The chaos theory, which does not support Newton's view that everything is linear, precise, and thus predictable, provided a basis for the complexity theory over time (Koç, 2004: 423). Chaos and complexity theories state that relationships within complex systems are nonlinear. In addition, these theories mention what disorder and confusion created and unpredictability. However, although there are common points between chaos and complexity theories, there are also specific differences (Mitleton-Kelly, 2003: 43; Rickles et al., 2007: 935).

Chaotic science is formed by the nonlinear and unbalanced progression of a couple of variables. In this case, chaos theory indicates nonlinear dynamics with constant repetition. In this direction, the order of disorder, independent from cause and effect relations in chaos theory, emerges as a result of the reflections of repetitive situations and events (Akçin & Zengin, 2020: 1311; Tüz, 2001: 4). Complexity science is about how the order will emerge from a complex and ongoing state. In fact, we can consider chaos as the basis of complexity. In this direction, complexity theory attempts to determine a whole shaped by gathering many chaotic situations and events together (McDaniel et al., 2013: 11-13). From a different viewpoint, according to the chaos theory, sometimes random behaviors in the system can be predicted, and sometimes they become unpredictable (Gürer, 2019: 227). Complexity theory, on the other hand, indicates that linear effects are unpredictable. In addition, complexity theory states that there is a multidimensional relationship between agents and that they have strong interactions created by their unpredictable consequences (Cochran-Smith et al., 2014: 110; as cited in Korucuoğlu, 2021: 55).

Essentially, from a broader perspective, the order that occurs in chaos theory is formed in consequence of the repetition of any event more than once. Accordingly, in this theory, the order is formed by the

repetitive actions occurring within the framework of some rules (Thietart & Forgues, 1995: 19). In complexity theory, on the contrary, adaptation comes to the forefront, and adaptive systems stray away from rules and repetitions. This situation changes the rules followed and utilized by the complex systems when performing their actions (Mitleton-Kelly, 2003: 43; Sayğan, 2014: 417). For some researchers, complexity in a system is between stability and chaos. Chaos begins where stability ends and systems start to behave chaotically under different conditions (Roslan et al., 2020: 24; Marion, 1999: 23). According to Lewin (1999: 61), we cannot say that the systems dominated by chaos are entirely disordered. These systems can create order within chaotic systems and organize themselves without any external influence (Lewin, 1999: 61). In complex systems, on the other hand, there might be sudden changes and the distinguishing feature of these systems cannot be predicted. These systems respond to a nonlinear and unbalanced change (Lewin, 1999: 61; Eppel, 2009: 12). In a complex system, the details are actually not fully comprehended. But the whole can be made more understandable due to the determination of the outline of events and situations (Tolga, 2003: 17). Briefly, in a complex system, a prediction of the outcome can be made, albeit partially, through models and probabilities. In a chaotic system, models and outlines may not be determined exactly. Therefore it is sayable that the details become incomprehensible in such a system (Tolga, 2003: 17; as cited in Kılıç, 2010: 26). However, according to the chaos theory, the behaviors in the system are more predictable than the complexity theory (Gürer, 2019: 227; Cochran-Smith et al., 2014: 110; as cited in Korucuoğlu, 2021: 55).

In this direction, the chaos theory with rules and repetitions and the complexity theory with the characteristics of adaptability differ completely in these aspects (Sayğan, 2014: 418). As a result, complexity theory was evaluated within chaos theory in the literature at the beginning stages due to its similar aspects. Sometimes these two theories are used to express the same thing at the same time. However, later on, when distinguishing the differences between these two

theories, it was understood that they should be evaluated as separate subjects (McMillan, 2004: 26; as cited in Sayğan, 2014: 418).

4. CHAOS AND COMPLEXITY THEORIES IN MANAGEMENT

The emergence of chaos science in the literature of management and organization, and then the research of complexity science in the last forty years has provided useful information for the field of management and organization (McMillan, 2004: 25; Gleick, 2014: 355-360; Roslan et al., 2020: 24).

According to Sellnow et al. (2002), it is difficult to predict outcomes created by the chaotic environment (Sellnow et al., 2002: 270). In this respect, organizational management should be open to cooperation in a chaotic environment and can be able to cooperate with the internal and external environment (Hudson, 2005: 24). Feedback is very significant for the organization to adapt to the environment, especially in a chaotic environment. With this feedback, organizations become self-organizing systems. In this sense, organizational management should pay attention to the feedback process and manage this process correctly (Hudson, 2005: 24; Koçel, 2014: 560). Managers can also detect various deviations while managing chaos, and they can create a new order by intervening in these deviations. In parallel with the chaos theory, the managers can help the continuation of productivity and creativity of the employees by keeping the organization close to the chaos (Morgan, 1998: 305; Tekel, 2006: 226-227). Besides that, organizational management should have a lean organizational structure and effective human resources management in addition to technology and innovation management to turn chaos into an advantage (Laszlo, 2004: 52; Yakut, 2018: 167). In this case, managers and employees need to be able to manage time and employee motivation well. In addition to this, it is essential for the managers to use crisis management, crisis communication, change management, and project management techniques in a chaotic environment. Managers should also try to cope with the chaotic environment through various

modern approaches such as organizational learning and modern leadership styles (Dereli et al., 2006: 28; Gleick, 2005: 14).

Change is also inevitable in a chaotic organization. In this case, the organization and employees should be willing to change, and they should be able to keep up with it (Dereli et al., 2006: 25). Change also leads to organizational flexibility. In this context, flexibility should be provided in a chaotic organization. Flexibility also refers to feeding on many sources. In this direction, a lean organizational structure can create flexibility in an organization (Yakut, 2018: 166-167). In addition, teamwork is crucial to prevent the effects of chaos and turn them into opportunities, and the information flow within and outside the organization should be provided quickly and healthfully by preparing a technological infrastructure (Yakut, 2018: 167; Taberner et al., 2020: 1) In this sense, according to some researchers, if the chaotic environment is managed successfully, it is inevitable for entrepreneurial organizations to take the advantage of this environment and be successful by taking risks (Bygrave, 1989: 28; Allen et al., 2011: 479). As a result, managers should constantly support the organization by attaching importance to technological developments, innovation, and knowledge sharing within the organization (Morgan, 1998: 305; as cited in Tekel, 2006: 227).

Sense-making and perception of the problems in the organization, identification of the problems related to management and doing the necessary research for them, and all the estimation skills and diversity in solving the problems are some of the elements that form the basis of complexity in organizations (Cooksey 2001: 78). In this sense, organizational management has a lot of responsibilities. Also, according to some authors such as Schneider and Somers (2006: 354), one of the most important propositions of complexity theory is that despite the experience, knowledge, and technology of the organization, the situations that will occur in the future cannot be fully predicted until their occurrence and change cannot be resisted (as cited in Turner & Baker, 2017: 12). However, this theory keeps the predictions of organizational leaders about the future alive and increases the ability of organizations to exhibit attitudes and behaviors according to possible

situations in the future (Reyes, 2013: 90; Mason, 2007; 12). In this case, this theory may offer significant theoretical advantages with respect to organizational dimensions such as planning, organizing, carrying out operations, and examining activities in parallel with organization or production management (Reyes, 2013: 90). Self-organization, which develops out of control and expresses a process, also occurs in organizations that can be able to manage complexity (Mason, 2007; 12-14). In this case, management cannot predict. However, managers can act most beneficially for the organization by focusing on technology and innovation and by staying in a dynamic structure.

According to Limburg et al. (2002), the attitudes and actions of employees in the organization affect the attitudes and actions of other employees within the framework of complexity theory. This interaction between employees also affects the organization. This interaction in the organization again produces an effect on the employees. There would always be unpredictability and uncertainty in this cycle (Limburg et al., 2002: 411; Smith & Humphries, 2004: 103; Sellnow & Seeger, 2013; as cited in Purworini et al., 2019: 37). Under these circumstances, the management tries to take systematic measures at first. However, when systematic measures are not fully effective, lean organizational structure, removal of hierarchy, empowerment, etc., elements should be applied in the organization. These elements indicate that this situation can be used for the organization by defending the individual attributes of the employees (Limburg et al., 2002: 411; Sellnow & Seeger, 2013; as cited in Purworini et al., 2019: 37; Berber, 2003: 12). In conclusion, managers know that cause-effect relationships lose importance while managing complexity, and it is difficult to predict situations and events. In this case, managers may see the senselessness of long-term plans and creating the vision. Efforts to adapt to the situations in complexity, learn the offers of the new order, and gain experience are all important (McMillan, 2004: 31). In this direction, managers who can manage complexity can use their past experiences in complex situations.

5. CONCLUSION AND EVALUATION

Uncertainty and confusion always predominate in the internal and external environment of the organization. In a process of this case, managers need to produce solutions for different conditions as quickly as possible and be flexible (Öcal & Özkara, 2018: 332). In this case, chaos and complexity theories make positive contributions to organizational management (Thietart & Forgues, 1995: 19; Mitleton-Kelly, 2003: 43). According to these theories, events are concerning other events taking place within the same system. Both theories investigate the relationships between variables and the dimension of unpredictability (Tekel, 2006: 225). However, there are also some specific differences between the two theories. The results created by these differences have a key role in the achievement and continuity of organizations.

There are continuous unpredictable and uncontrollable effects on the organization and its environment. In this case, organizational management is constantly occupied with the management of chaotic events (Gürer, 2019: 227; Farazmand, 2003: 340). In such an environment, managers should see the potential risks and cope with uncertainties and paradoxes (as cited in Gürer, 2019: 227). In other words, the management of the organization should do the necessary to manage the chaotic situation well and then turn the chaos into an advantage for the organization by revealing all the necessary knowledge for such an environment (Mercan et al., 2013: 117). According to the chaos theory, organizational management should attempt to adapt to the situation in abruptly changing conditions, and turn crises into good opportunities (Koçel, 2014: 559). Furthermore, Toffler & Toffler (2006) states that with the chaos theory, the hierarchy between subordinates and superiors in organizations gets beyond certain limits, employees take more flexible responsibilities in their tasks over time, and the use of flexible time has started through the utilization from this theory (as cited in Mercan et al., 2013: 125).

In complexity theory, on the other hand, there are nonlinear relationships between individuals and functions in an organization (Gleick, 2000: 24; as cited in Öztürk & Kızılkaya, 2017: 259; Allen et

al., 2011: 526). In this direction, it is hard to provide impressive communication for individuals, functions, and departments. The task of managers is to act correctly and adapt immediately to change as in a chaotic environment (Allen et al., 2011: 526). In this sense, complexity theory is utilized to model nonlinear dynamic behaviors in different fields, especially in organizations (Kurtz & Snowden, 2003: 463). Complexity theory cannot also be approached as a tool in organizations. This theory enables the employees to review and present their opinions related to said issues together (Mowles et al., 2010: 141). In this case, in complexity management, the manager should appreciate the employees' opinions and support them always to turn complex situations into the benefit of the organization. In addition, complexity theory forms a conceptual framework for organizations for a dynamic and flexible evaluation (Reyes, 2013: 92; Roslan et al., 2020: 24).

In this study, we examined the use of chaos and complexity theories in the field of management affects organizations and we thought that significant findings were presented to the literature. This study also aimed to contribute to the formation of new principles and methods for the literature and create a resource for future studies. Additionally, in this study, it is determined that the benefits of these theories to organizations can be increased further by taking more advantage of the characteristics of chaos and complexity theories. In this sense, supporting managers who can look at problems from a creative perspective can be advantageous in terms of organizational change and improvement. Finally, in future studies, it is possible to do new researches that will reveal the most effective leadership styles in order to ensure more use of the characteristics of chaos and complexity theories in the field of management.

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CHAPTER 2
COUNTERPRODUCTIVE WORK BEHAVIORS

Assist. Prof. İsmail ÖZDEMİR¹

¹ İstanbul Gedik University, Sport Science Faculty, Sport Manager Department,
E-mail: ismail.ozdemir@gedik.edu.tr ORCID: 0000-0001-6478-9168

INTRODUCTION

Employees are expected to contribute to their organizations. They are recruited with such expectations. But due to various reasons they may be a threat to the organization. Their deliberate behaviors aim to harm the organization are called counterproductive work behaviors.

Previous studies determined that counterproductive work behaviors can be triggered by many different variables. Abusive supervision is an example of such antecedents. Supervisors attempt to avoid counterproductive work behaviors, but abusive supervisors trigger such behaviors.

Counterproductive work behaviors deviate from the purposes of the organizations. The employees participating in counterproductive work behaviors ignore the aims of their organization and the success of its operations. They can easily cause a failure or even a trouble on the continuity of the operations.

There are various forms of counterproductive work behaviors. These are deliberate behaviors. Mostly, psychopathy of the employees are the main reason for such behaviors. Rarely, some other factors such as burnout, misunderstanding, bullying, or abusive supervision may trigger counterproductive work behaviors of the other employees. The feeling of being trapped may cause counterproductive work behaviors or the employee may need to get relieved and counterproductive work behaviors may provide such a relief.

The supervisors may also commit counterproductive work behaviors, but this is called abusive supervision. Therefore these two concepts should be distinguished. Because abusive supervision has a strong effect and it can even change the work environment and the tendency to mistreatment behaviors in a work environment. But counterproductive work behaviors are usually hidden behaviors.

Counterproductive work behaviors might be harming the other employees or the organization. Depending on the results of the behavior, they are classified. It is also possible to see that these behaviors serve the self-interests of the employees. These are called

self-serving counterproductive work behaviors. There might be other reasons just like revenge or grudge to the other employees.

1. PURPOSES AND KINDS OF COUNTERPRODUCTIVE WORK BEHAVIORS

Counterproductive work behaviors may have various purposes. But the main purposes are sabotaging the other employees, withdrawal, theft, or abuse. These are also the sub-scales of the counterproductive work behavior scale.

The employees sabotaging the others may attempt to take the position of the other employee. It is also usual to see employees accepting other employees who are capable of doing something admirable as a threat. Thus, the employees may sabotage another employee to remove a threat for their promotion or to empty a seat that they are willing to take.

Some employees may have psychological personal disorders. Such employees also prefer to sabotage the others. The reasons for these sabotaging behaviors may vary regarding their psychological personal disorder. For example, psychopath employees enjoy to cause harm to the other employees. Paranoid employees have a tendency to accept other employees as a threat and they do not need logical reasons for that.

Managers do not prefer counterproductive work behaviors. Especially sabotaging behavior is something they try to determine and avoid. Because each manager is responsible for the duties of his/her subordinates indirectly. When they fail, the team may fail and there might be some obvious results related to this failure.

Counterproductive work behaviors can be anything. The shape of this behavior is decided by the perpetrator. These are usually some behaviors that can hide their malicious purposes or they are socially acceptable behaviors. For example, pouring a drink can happen to anyone. It is acceptable as long as it is an accident. But it is very difficult to distinguish the intent in such a situation. It will also be difficult to detect the intention of an employee pouring juice or coffee on the work files of another employee. Sometimes, the other employee cannot

encourage to claim that the intention of the other employee was already doing that, because they might be afraid of the reaction of the other teammates or a claim of disrupting the peace of work environment.

Some employees avoid working and they even avoid being in the workplace. This situation will cause a burden on all the other employees. The duties that need to be fulfilled might be followed by some other employees and they might be performed by them. Especially the lack of employees can cause interruptions on the operations of an organization.

Employees might be looking forward to get more payment, but they might be unwilling to work more. They may show themselves just like they are working after the work hours. They can even exaggerate their extra work hours to get more payment. When there is a lack of monitoring, they can do this more easily. In fact, this is a theft and it is a kind of counterproductive work behavior.

The office tools can be stolen by the employees. Some of them can also be used for personal purposes. These will bring an extra cost to the company. But an employee with a tendency to theft does not only steal from the company. They also tend to steal from the other people, just like their colleagues or customers. It depends on the opportunities they will have. Such theft behaviors will be ruining the peace in the work environment. The employees or the customers will not feel secure in the company anymore.

The counterproductive work behavior can have many shapes, just like misunderstanding the orders. The employees may try to deviate the given orders or pretend like they do not understand them. This will cause a burden on the managers. Depending on the situation, this burden will be increasing. In such situations, backwork will be necessary. For example, if an employee does not assemble the necessary parts of a furniture in the customer's house, a backwork will be necessary and this will be a waste of time and money for the company.

The employees can deviate the operations of a company by using various different ways. They can hide a necessary tool, they can postpone the repair of a machine or they can claim that a spare part is

necessary to be able to repair it even though it is not necessary. They can cause serious troubles and they can use their opportunities. Sometimes they want to get some rewards and they make counterproductive work behaviors to be able to get that reward or they might be reacting to a punishment and that can be the reason for counterproductive work behaviors.

The employees may plan to decrease their workload. They may pretend like they work slowly or they cannot understand the given orders. This will increase the burden of the hard-working employees. Because the managers who should have all the tasks done will be using new strategies and they will use the other employees as the previous ones could not perform such tasks. The employees committing counterproductive work behaviors can also say something that was not said by the supervisors.

Employees also prefer counterproductive work behaviors due to their personality disorders. Such a purpose of participating in counterproductive work behaviors is widespread. The employees may feel like they are not better than the others and they can start to gossip about the others. They can blemish their work or they can start gossips about their personal life.

The performance of another employee might be the reason for counterproductive work behaviors. The employees who cannot catch the performance targets may tend to decrease the performance of the other employees. They can harm the softwares, computers, or even the vehicles of the other employees.

Incivility is accepted as the behaviors that are not kind and the purpose is unknown. If the employee is being rude deliberately, this is also called counterproductive work behavior. The employee might be rude to its colleagues or supervisors. It is also possible to see the employees being rude to the customers and clients.

2. TARGETS OF COUNTERPRODUCTIVE WORK BEHAVIORS: ORGANIZATIONS AND COWORKERS

Counterproductive work behaviors affects the strategies of the organizations and the policy of the managers negatively. These behaviors aim to harm and deliberate. Therefore counterproductive work behaviors include various types of mistreatments.

Organizational structure includes determining a strategy and implementing this strategy in different departments according to the styles of the departmental managers. Thus, strategy selection and implementation is a sensitive process. It needs a careful planning. Counterproductive work behaviors stand as a threat to this process.

Counterproductive work behaviors can aim the coworkers of the employees. As a result, the motivation of the employees will be ruined. They will be distracted. This will end up with deviation from a successful implementation of the strategy.

The success of the teams are evaluated by using the performance management criteria. These are prepared according to the strategy and implementation process. A careful arrangement will be made for some certain groups by team leaders due to their specific features. This sensitive process can be spoilt by counterproductive work behaviors. An employee with such an attitude can introduce a wrong strategy to the others, he may distract them and keep the team away from the target by spoiling the system. Moreover, he can individually misunderstand the strategy and provide deceptive feedback about the comprehensibility of the implementation process. Such wrong feedbacks will make the decision-making process more difficult as the team leaders will not be able to distinct the most comprehensible implementation techniques.

Counterproductive work behaviors can aim a whole system. It can attack the most important function of an organization: strategy and implementation. Hence, it is not something that can be underestimated.

Counterproductive work behaviors might be coming from less social and less intelligent employees. Even such employees perpetrating these behaviors can hide their intention if they are careful enough. All they need to do is having a socially acceptable attitude.

Who can blame them if they do not understand the bylaws or the demands of the customers? Everyone can misunderstand something anytime. It is easy to hide their intention by behaving kindly.

Monitoring is the hardest process in an organization. The managers cannot monitor everything and every place of an organization. More knowledge will help the employees to learn the most important places of an organization and whether those places are monitored. Counterproductive work behaviors might be happening in such places. For example, a very expensive and fragile tool can be broken suddenly, or there might be unexpected power cut-off that may stop the operation of the organization.

The harm that can be caused by counterproductive work behaviors is limited with the abilities of the employees. The opportunities they may catch will be increasing the magnitude of this harm. Trust is very important in an organization as monitoring every employee is not possible and a person can hide himself or his fault in a crowded organization.

The organization is a common target for the perpetrators. They may have various reasons for that. These reasons can be personal or they can be a result of a certain aim. For example, the employee may seem like the only successful person in a failing organization, or he may have personality disorders that pushes his instincts to harm the operations of the organization. But the employees can also be the target of the perpetrators.

The employees can choose their coworkers as a target. Some of these employees committing counterproductive work behaviors to harm their coworkers aim to take revenge due to some incivil behaviors or bullying and some of these employees committing counterproductive work behaviors to harm their coworkers aim to show the other coworkers taking place in the team as successful employees. In other words, the purpose of getting promoted as a manager can be the reason for counterproductive work behaviors.

The employees committing counterproductive work behaviors can cause informal groups in an organization. Informal groups are not preferred by the managers as they are the main reason for ostracising

and alienation behaviors. Informal groups may also start discrimination in a work environment as they will gain a certain amount of power as a group and individuals will be weaker for them. Individual employees seeming to be easy targets for them can be easily ostracized, alienated or even bullied.

The techniques of the employees to perpetrate counterproductive work behaviors may vary, but their target will be the organization or another employee. But we must remember that supervisors are also employees and they can easily be the target of a confident employee. Especially if the counterproductive work behaviors aim a promotion as a manager, the employee can choose the existing manager as a target. Such employees tend to form informal groups, to show such supervisor as unsuccessful and rude, and to act like he is being insulted by the supervisor. Being victim will attract the attention of the other employees and people tend to protect the victims. Especially, the people tend to select the administrators among the victims with the expectation of such administrators do not have a tendency to harm the others.

3. ANTECEDENTS OF COUNTERPRODUCTIVE WORK BEHAVIORS

It is inevitable to see in an organization that counterproductive work behaviors are affected by some other constructs. There are various constructs impacting counterproductive work behaviors. Some employees may have a tendency to perpetrate counterproductive work behaviors, but there are still some other factors increasing counterproductive work behaviors by affecting the intention and emotion of the employees.

Organizational citizenship behavior is accepted as the main antecedent of counterproductive work behavior. Organizational citizenship behaviors are positive actions contributing to the operations of the organization. They are voluntary constructive behaviors. The organization nor the managers do not ask for such behaviors, but the employees prefer committing such behaviors.

The employees committing organizational citizenship behaviors are sensitive about their duties. They also support the other employees and any part of the operations whenever it is necessary. They protect the resources of the company and attempt to reduce the costs. They speak positive about the company and they do not avoid working for extra hours. The satisfaction of the customers appear to be important for them and it is something that cannot be neglected.

Organizational citizenship behaviors has a negative effect on the counterproductive work behaviors. The employees participating in organizational citizenship behavior prefer to work in a harmony with the organization. They tend to arrange their shift according to the demand of the other employees, they pay attention to the requests, needs, and complaints of their coworkers. They trust their organization and its members.

There are various other antecedents of counterproductive work behaviors. Organizational culture and organizational performance are among the main confirmed antecedens of counterproductive work behaviors. The employees can hide their counterproductive work behaviors in a busy organization with a high organizational performance. The organizational culture may be encouraging or discouraging counterproductive work behaviors.

The abusive supervision or the bullying of the coworkers are also some other significant antecedents of counterproductive work behaviors. The employees who are treated in an unfair way tend to react. This reaction might be directed to the other employees. If they cannot direct it to the perpetrators, they can direct such behaviors to the organization and its operations.

Mistreatment triggers counterproductive work behaviors. The employees avoid mistreatment, but whe workplace bullying is common, it is difficult for them to avoid. The stress caused by such behaviors needs to be discharged and counterproductive work behaviors may provide such a discharging feel. The perception of harming the others or their performance the perpetrators of bullying will cause a relief on the victim. The employees with a lack of ethics tend to commit such counterproductive work behaviors easily.

Customer mistreatment is also another antecedent. The employees might be humiliated or harrassed by the customers. The results may include counterproductive work behaviors. Especially, the employees with social phobia or rumination are affected by customer mistreatment more than the others. Rumination is also a significant antecedent of counterproductive work behaviors.

Just like personality disorders, personality traits are also antecedents of counterproductive work behaviors. Big 5 personality traits (extraversion, agreeableness, neuroticism, conscientiousness, openness to experience) are confirmed as significant antecedents of counterproductive work behaviors.

The employees accepting the organization as their own and feeling oneness with the organization tend to perpetrate counterproductive work behaviors less than the others. This is called organizational identification and it is an antecedent of counterproductive work behavior. Such employees with high organizational identification feel like the failures of the organization are their own failures.

Work engagement also has a negative directed relationship with counterproductive work behaviors. The employees with high work engagement find their organization valuable as it provides the ability of doing such a job for them. These employees work with high vigor, dedication, and absorption. They feel energetic and robust while they are working. They dedicate themselves for their work and their work comes first. They collect the necessary knowledge and they concentrate on their work. These features are called vigor, dedication, and absorption. They are the subscales of work engagement and they are also significant antecedents of counterproductive work behaviors.

Psychological detachment is about avoiding work-related stress during the times spent out of the work environment. It is the opposite of work-life conflict. The employees with psychological detachment contribute to their well-being by keeping their mind away from the stress related to their job during their daily life. Psychological detachment is a significant antecedent of counterproductive work

behavior and it has a negative effect on counterproductive work behavior.

Perceived organizational injustice and psychological contract breach cause similar feelings on the employees and they both have a significant effect on counterproductive work behaviors. Feeling of justice is a psychological need and it can decrease the counterproductive work behaviors. Distributive justice, interpersonal justice, procedural justice, and informational justice are all significant antecedents of counterproductive work behavior.

Psychological capital refers to the positive attitudes or perceptions of the employees. These positive state can be due to optimism, resilience, better hopes for the future, and feeling of self-efficacy. This construcy has a negative relationship with counterproductive work behaviors and it is a significant antecedent.

Defensive silence and acquiescent silence are some other significant antecedents of counterproductive work behavior. Defensive silence occurs with the purpose of protecting yourself from the mistreatments. It is also accepted as proactive behavior. On the other hand, acquiescent silence is not proactive. It is about hiding the necessary knowledge and tending to avoid from getting involved.

Work engagement is not the only job attitude affecting the counterproductive work behaviors. Affective commitment and job satisfaction are some other job attitudes affecting counterproductive work behaviors. Job satisfaction is the positive emotional state that is caused as a result of the factors related to one's job. It has a negative and significant effect on counterproductive work behaviors.

Affective commitment also refers to positive emotions, but these emotions provide a link between the organization and the employee rather than providing a satisfaction. This construct is another significant antecedent of counterproductive work behavior. It also has a negative impact on it.

There are various other predictors of counterproductive work behavior. But the ones explained here can be useful to understand the concept of counterproductive work behavior. counterproductive work

behavior is a construct that can be well-understood together with its predictors.

4. OUTCOMES OF COUNTERPRODUCTIVE WORK BEHAVIORS

There are different techniques to assess the counterproductive work behaviors in a work environment. But the most common one is allowing the employee to evaluate himself/herself. This is called the “self-reporting technique”. We can say that the listed antecedents of counterproductive work behaviors are the ones that are predictors of counterproductive work behaviors that are “self-reported”.

The second technique of assessing counterproductive work behaviors is called the “peer-reported technique”. It is also possible to use a “supervisor-reported” scale, but this is not common. Peer-reported technique is important, because counterproductive work behaviors measured by using this technique will have more outcomes than self-reported counterproductive work behaviors.

The only outcome of the self-reported counterproductive work behaviors is the performance. The employees evaluating their own counterproductive work behaviors can also evaluate the organizational performance. There is a negative relationship with the counterproductive work behaviors and organizational performance (Abdullah vd., 2021).

Peer-reported counterproductive work behaviors also affects performance. But the main outcome of peer-reported counterproductive work behaviors is the turnover intention and it is suggested that such behaviors have a negative effect on turnover intention (Liu vd., 2022).

Turnover intention is the beginning of the way to turnover. Turnover causes some extra costs to the company and extra burden to many different departments. Because it means that experienced and trained employees will be quitting and all these efforts will be going out of the window. The employees experiencing and witnessing counterproductive work behaviors tend to leave the organization. Hence, counterproductive work behaviors increasing the turnover intention will bring some extra harm to the organization.

5. CONCLUSION

The managers aiming to increase the performance of an organization should monitor the counterproductive work behaviors as it can be the biggest threat on the organizational performance in an organization. The creativity of the employees can make it more difficult to detect as it has counterproductive work behaviors has no borders. The intention of the employees should be defined first to be able to detect counterproductive work behaviors.

The organizations cannot underestimate counterproductive work behaviors as the harms caused due to this kind of behaviors can reach significant amounts. It might be invisible, but this does not decrease the amount of harm caused by such behaviors. The first subscale of counterproductive work behavior is “sabotage” and it can explain the most vital features of this behavior: very harmful and very hidden.

Previous studies showed that the work environment has a significant effect on the counterproductive work behaviors. The climate of an environment is anticipated by the employees and depending on the employees and the work environment, counterproductive work behaviors might be contagious. Because the employees might encourage each other to commit such behaviors. Consequently, a manager ignoring such behaviors and neglecting to take precautions may lose his/her position due to the employees perpetrating counterproductive work behaviors.

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CHAPTER 3

WHAT IS THE SERVANT LEADERSHIP STYLE?

A LITERATURE REVIEW ON THE CONCEPT

Assist. Prof. Dr. Ahmet GÜMÜŞ¹

¹ Ağrı İbrahim Çeçen University, Faculty of Economics and Administrative Sciences, Public Relations and Advertising Department, Ağrı, Türkiye, ahmetgumus4006@gmail.com, Orcid ID: <https://orcid.org/0000-0001-7089-5936>.

INTRODUCTION

Leadership is the ability to motivate employees of an organization to achieve organizational targets and people with this ability and experience are called leaders (Kalkan, Altınay Aksal, Altınay Gazi, Atasoy & Dağlı, 2020: 2). Many leadership styles are mentioned in the literature. One of these leadership styles is servant leadership, which emerged from the service culture characteristics that managers can have for the employees of the organization (Garber, Madigan, Click & Fitzpatrick, 2009: 332). Emotional, moral, and relational dimensions of leadership are emphasized in a theory put forward by Robert K. Greenleaf on the assumption that leaders put the needs of their followers first (Liu, 2019: 1099; Spears, 1996: 33). In this context, servant leaders focus on meeting the desires and needs of the organization and employees rather than their own desires and needs (Al-Alsadi, Muhammed, Abidi & Dzenopoljac, 2019: 473). On the other hand, it was also reported that leaders show four basic behaviors in the servant leadership type, which are originality, empowerment, direction, and management (Van Dierendonck & Patterson, 2015: 120). Leadership is an important indicator in increasing organizational performance as one of the leadership styles mentioned in the literature on servant leadership.

In the present study, the purpose was to conduct a literature review on the concept of servant leadership. In this regard, the study consisted of three parts, introduction, literature review, conclusion, and recommendations. Brief information about the subject, and the importance and purpose of the subject are mentioned in the introduction part. In the literature review part, the leader(s), the definition of servant leadership and the characteristics of the servant leader, the emergence and theoretical origin of the servant leader, and the benefits and importance of servant leadership are mentioned.

1. LITERATURE REVIEW

1.1. Leadership and Leaders

Leadership is among the most discussed and researched concepts in behavioral sciences because it is an important concept that ensures the effectiveness and efficiency of organizations through leaders (Parris & Peachey, 2013: 377). Leadership is a concept that shows the organization's ability to successfully achieve the targets set by the organization through the efforts of its employees (Al-Sadi et al., 2019: 472). The process of motivating employees in the organization to achieve organizational targets is called leadership (Kalkan et al., 2020: 2). Leaders have key roles in solving problems and uncertainties faced by organizations (De Sousa & Van Dierendonck, 2014: 879). The role of leaders in leadership is important as they are very effective in shaping the organizational climate by directing the behaviors of the employees in the organization (Gotsis & Grimani, 2016: 985). In terms of the leader-follower relationship, leaders are expected to be effective in obtaining more efficiency from followers (Choudhary, Akhtar & Zaheer, 2013: 433). Leadership is considered the key to organizational success, and this success depends on the work of the leader and followers in agreement.

1.2. The Definition of Servant Leadership and Characteristics of Servant Leaders

1.2.1. The Definition of Servant Leadership

Although many definitions of servant leadership are made in the literature, the most common definitions of servant leadership are as follows:

- Servant leadership is a holistic leadership approach with the ability to influence followers in more than one dimension, such as moral and emotional (Eva, Robin, Sendjaya, Van Dierendonck & Liden, 2019: 111).

- Servant leadership is a model in which mutual trust is essential between the leader and the followers, aiming to uncover the talents, needs, desires, targets, and potential of the followers through effective communication techniques (Liden, Wayne, Zhao & Henderson, 2008: 162).
- Servant leadership, which aims to motivate followers by influencing, empowering, and developing with managers by using empathy and humility, differs from other leadership styles in this respect (Mittal & Dorfman, 2012: 555).

1.2.2. Characteristics of Servant Leaders

Servant leaders treat their followers morally and with humility and put their interests first over their own interests (Bao, Li & Zhao, 2018: 406). Managers who adopt and implement the servant leadership style in an organization believe that meeting the desires and needs of followers is more important than the realization of organizational targets (Jaramillo, Grisaffe, Chonko & Roberts, 2009: 351). Servant leaders influence their followers with their unique characteristics such as honesty, morality, and self-sacrifice within the framework of ethical leadership (Saleem, Zhang, Gopinath & Adeel, 2020: 1). Leaders with this type of leadership act with the ability and power to motivate followers (Cerit, 2010: 304). Servant leader traits include high imagination, but this trait also allows leaders to align their thoughts with the experiences of their followers (Heyler & Martin, 2018: 232). It can be argued that leaders with this leadership style have empathy, integrity, honesty, and morality.

1.3. The Emergence and Theoretical Origin of Servant Leadership

Servant Leadership emerged when G. R. Greenleaf (1970) introduced the ‘Servant Leadership Theory’ to the scientific world. In this theory, leaders show an example of self-sacrifice and instantly cover the wishes and desires of followers by empathizing with them

(Van Dierendonck & Patterson, 2015: 120). Although the theoretical origin of servant leadership is based on the theory of social exchange, according to this theory, followers also establish a trusting relationship with their leaders (Parolini, Patterson & Winston, 2009: 276). The origin of servant leadership is based on the ‘Social Change Theory’ in which a social exchange relationship is established between the leader and followers based on a mutual win-win strategy based on a contract (Chan & Mak, 2014: 275). Leaders assign various tasks to their subordinates and empower them with these assigned tasks through these relationships (Bao et al., 2018: 406-407). Servant leaders direct the behaviors of their followers through social change. They also direct them to the achievement of organizational targets (Liden et al., 2008: 163). Also, ‘Social Learning and Social Commitment Theories’ are among the approaches that form the basis of servant leadership in the literature (Winston & Fields, 415). The common point of these approaches is that employees increase performance with a commitment to the organization by imitating the behavior of their leaders (Chon & Zoltan, 2019: 3372-3373). It was reported in the literature that the theoretical origin of servant leadership is based on the theories of social change, social learning, and commitment.

1.4. The Benefits and Importance of Servant Leadership

Servant leadership is beneficial for the well-being of the employees and the sustainability of the organization because it is a people-oriented leadership model (Bavik, 2020: 347). Unlike other leadership styles, servant leadership contributes to the personal development of followers by serving them in more than one way (Eva et al., 2019: 114; Rachmawati & Lantu, 2014: 389). As the ‘leader’ managers of organizations, servant leaders play active roles in the development and growth of their subordinates (Chan & Mak, 2014: 275). In this leadership philosophy, on the one hand, moral concerns and customer expectations are considered, and employees are guided by creating organizational culture and commitment to organizational

targets, on the other hand (Eva et al., 2019: 111). Leaders who adopt this type of leadership style help their subordinates achieve organizational targets (Carter & Baghurst, 2014: 454). Since servant leadership focuses on the well-being of others rather than itself, the agency is important in solving problems in organizations (Heyler & Martin, 2018: 235). On the other hand, it is mentioned that this leadership approach increases the trust level of the followers in the leader (Sendjaya & Pekerti, 2010: 644). However, leaders with this leadership characteristic can lead their employees to display ethical behaviors by creating an ethical culture and the ethical organizational climate in the organization (Reed, Vidaver-Cohen & Colwell, 2011: 421). This leadership model is important in terms of producing solutions to problems in an organization. It was reported in previous studies that these servant leaders are beneficial in terms of achieving organizational targets by directing employees.

2. CONCLUSION AND RECOMMENDATIONS

Management is the job of achieving results through others and leadership is the ability to mobilize followers to achieve organizational targets, which is one click beyond management. Whether it is management or leadership, the common point of both concepts is employees. In other words, it is only possible for a leader or manager to achieve success with his teammates. For this reason, a leadership model excluding people has no chance of success in management and organizational activities. A leader can be successful with the ability to lead employees under him effectively and efficiently toward organizational targets. For this reason, leadership is an indispensable value sought in organizations as a management and organizational approach that should be applied to the solution of problems in a sustainable manner.

Regarding leadership, various leadership styles have been developed. One of these is servant leadership. It was mentioned in the literature that servant leadership depends on the theories of social

change, learning, and commitment. Leaders with this leadership style have the thought of empathizing with their followers. On the other hand, it was also argued that the main duty of the leader in servant leadership is to cover the desires and needs of employees, as well as to serve the organization in terms of the realization of organizational targets. It was also mentioned that the trust of followers in a leader is high and that this leadership approach is beneficial in creating an ethical organizational climate. On the other hand, it was argued that servant leaders with superior abilities are beneficial in terms of directing employees to organizational targets and providing motivation.

In the present study, the purpose was to conduct a literature review on servant leadership. Based on the assumption that leadership is an important value for organizations, the study emphasized the importance of servant leadership in terms of ensuring organizational efficiency and success. The study is thought to be useful for managers who are interested in different leadership styles both in the literature and in practice. Also, researchers interested in the servant leadership style may be advised to examine the relationship between this concept and variables such as job satisfaction, job performance, organizational commitment, and organizational justice.

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CHAPTER 4

JOB-LIFE BALANCE: A RESEARCH IN TEXTILE SECTOR IN BURSA CITY

Assist. Prof. Dr. Nilüfer RÜZGAR¹

¹ Bursa Technical University, Faculty of Humanities and Social Sciences, Department of Business Administration, Bursa, Turkey. Nilufer.ruzgar@btu.edu.tr, Orcid ID: 0000-0002-9598-3390

INTRODUCTION

Balance practices have started to become an increasingly important issue in today's post-industrial societies, due to fact that concerns and expectations regarding the quality of life have increased as well (Hilbrecht, et al., 2008). Old expressions such as “equality of opportunity, positive discrimination” in today's corporate, managerial and academic discourses are gradually being replaced by “work-life balance, “work-life integration”, “flexibility” etc. concepts (Smithson and Stokoe, 2005). Work-life balance practices (Schilling, 2015), which emerged as a desirable subject in the current social development of Western countries, differ from country to country and from institution to institution. Today, employees that are more aware of work-life balance, flexible working hours, arrangements such as working from home or care of children or elderly family members in the workplace, etc. desires to work in employee-friendly organizations (Tosun and Keskin, 2017).

In this sense, the main purpose of this study is to research job-life balance attitudes of employees, especially under the pandemic and post-pandemic conditions. The frame of the research consists white collar employees in production sector as population. On the other hand, the fact that it is not possible to reach the whole population in terms of time and budget, the employees in textile industry in Bursa city Nilüfer Organized Industrial Zone are taken as sample. A survey form that includes demographical questions and Hayman's (2005) Job-Life Balance Scale, is prepared and delivered to the potential participants via e-mail. 202 responds have been gathered and the gathered data is analysed via SPSS 22.0 package programme.

1.THE CONCEPT OF JOB-LIFE BALANCE

The origin of the concept of work-life balance dates back to the 1930's. Before World War 2, a company named W. K. Kellogg was the first to create four 6-hour shifts instead of three eight-hour shifts, which increased employee morale and productivity. In the following eras, RM. Kanter's book titled “Work and Family in the United States: A Critical Review and Agenda for Research and Policy” published in

1977, brought the issue of work-life balance to the attention of organizations and researchers (Küçükusta, 2007; Genç, Genç ve Gümüş, 2016).

Work-life balance is an issue that has started to be included in the literature in the last 20 years, especially with demographic changes such as the increase in the number of women with children in the workforce and advances in technology (Wang and Verma, 2012). “Work-life balance”, as a term, is known to be used for the first time in the mid-1970s (Borah and Bagla, 2016) and the reason for the term to emerge was the inability to ignore workplace demands while using the time spent with the family or described as “empty” and to integrate these two phenomena (Kaliannan et al., 2016). Thus, the inclusion of the term as a subject in the literature is based on the fact that employees started to take into account that business life negatively affected family life in 1980’s (Choudhary and Singh, 2016; Akin, Ulukök and Arar, 2017).

There are different definitions regarding the concept of work-life balance that are come across frequently in the literature. According to Chandra (2012), work-life balance is about responding to individual conditions, individuals’ own responsibilities and desires. Greenhaus et al. (2003), defined work-life balance as that the individual is equally occupied with the job role and the family role, and satisfies them equally. They also suggested three elements for work-life balance: *time balance*, *involvement balance* and *satisfaction balance* (Kıdır, 2018).

As for the factors that affect work-life balance, it is seen that there are both personal factors and work related factors. While personal factors can be counted as *age*, *having children*, *experience* etc., work related factors include workplace determinants such as *work autonomy*, *working time flexibility*, *working hours*, *social support provided by colleagues and managers*, and *family-friendly work policy* etc. (Jennings and McDougald, 2007).

In today’s organizational world, there are a wide variety of applications that aim to increase the productivity of organizations and thus, to keep up with technological developments, social changes and crisis. This situation, on the other hand, causes employees to work

more intensely and as a matter of fact they get tired more both physically and mentally. In this sense, the necessity of individual motivation of employees has gained more importance in terms of increasing the efficiency and thus, the quality of work life. In addition, employees have private lives in which they have various roles far different from work life, such as being spouses, parents, sisters/brothers, friends etc. With the socio-economic and demographic changes that have come with the difficulty of business life, technological advances and globalization, these two life styles as Professional and private, have intersected and have started to violate each other's fields (Akın, Ulukök and Arar, 2017).

Furthermore, because of globalization and severe competition, working on a shift system is preferred by a great number of organizations. However, shift system is associated with an increased risk of both physical and psychological disorders (Boggild and Knutsson, 1999). As for family lives and social lives, shift work has also been proved to have a negative impact (Burch, Tom, Zhai, Criswell, Leo and Ogooussan, 2009), because of the fact that working at irregular hours may limit the time that can be spent with family and friends and thus, lead to unbalance of work-private life (Shiffer, Minonzio, Dipaola, Bertola, Zamuner, Dalla, Vecchia, Solbiati, Constantino, Furlan and Barbic, 2018).

Moreover, especially since the beginning of 2020, because of the COVID-19 pandemic, many employees have started to work with the help of computers and other communication tools without going to work, which is called remote working. It is stated that working from home has advantages such as using time flexibly, sparing more time for family and private life and saving time that is spent on the road. The number of professions that can be included in home-based occupational groups is increasing day by day. However, there are also those who state that working from home has disadvantages. First of all, working from home is increasingly blurring the boundaries between work and non-work areas. Employees largely decide where and when to work, but this flexibility causes an imbalance between work and non-work roles (Kıdır, 2018). Especially in the times of pandemic as it is stated

above, employees who live with their family and children, had to take care of them as well, because of the fact that the education was also remote and there were restrictions in terms of going out. Therefore, sustaining the balance between work and private life became more and more difficult and important.

2.METHODOLOGY

The main purpose of the current study is to research the job-life balance attitudes and perceptions of white collar employees in production sector under the pandemic and post-pandemic conditions. With this purpose, white collar employees that work actively in textile industry in Nilüfer Organized Industrial Zone, Bursa city, are defined as sample. A survey form consisting demographical questions in addition to Job-Life Balance Scale that is developed by Hayman (2005), is formed and delivered to the potential participants via e-mail. 202 responds have been gathered and the gathered data is analysed via SPSS 22.0 package programme.

2.1.Findings

According to demographical findings, 116 (%57,4) participants are women, 86 (%42,6) participants are men. As for age groups, 74 (%36,6) participants belong to 18-24 age group, 64 (%31,7) participants belong to 25-34 age group, 55 (%27,2) participants belong to 35-44 age group, 8 (%4,0) participants belong to 45-54 age group and 1 (%0,5) participant belongs to 55+ age group. In terms of education, 11 (%5,4) participants are high school graduates, 157 (%77,7) participants are undergraduates and 34 (%16,8) participants are post-graduates.

2.2. Hypothesis

H0: There is no statistically significant difference between the socio-demographic (gender, age, education, experience, department) characteristics of white collar employees in production sector and their attitudes towards Job-Life Balance. $h_0: \mu_1 > \mu_2$

H1: There is statistically significant difference between the socio-demographic (gender, age, education, experience, department)

characteristics of white collar employees in production sector and their attitudes towards Job-Life Balance. $H_1: \mu_1 > \mu_2$

2.3. Reliability Findings

The survey form includes two sections. The first section presents demographical questions, and the second section presents the Job-Life Balance Scale Hayman (2005). According to the factor analysis, the items of the current scale gather under 3 dimensions. These dimensions are called *unbalance of private life*, *balanced life (private and work)* and *unbalance of work life*. In addition, the reliability analysis of the scale shows that the cronbach's alpha value of the scale is 0.812.

Table 1. Cronbach's Alpha Value of the Scale

Scale	Cronbach's Alpha Value	Number of Items
Job-Life Balance Scale	,812	15

2.4. Research Findings

2.4.1. Descriptive Statistics

The descriptive statistics results of the Job-Life Balance Scale proves that the most important item according to the participants is the 6th statement with a mean of 3.85, "I make an effort to balance my work and non-work responsibilities". Secondly, there is the idea of "My private life gives me energy to do my job" which is the 12th statement with an average of 3.55. As the the third important item, there is the idea of "I have a high morale in my job because of my private life", which is the 14th statement with 3.53 average.

It can be concluded that the participants do not have problems in balancing their private lives and work lives. It can also be understood that the participants try to do their bests in order to balance their private and work lives and they also try to reflect the positive parts of their private lives to their work lives.

On the other hand, the item that is the least important for the participants is the 10th statement, with an average of 1.68, "My job is

negatively affected due to my private life”. In this sense, it can again be inferred that the participants do not allow their private lives affect their work lives negatively and they try to balance their both lives.

Table 2. Descriptive Statistics

Items		Totally Disagree	Disagree	Neutral	Agree	Totally Agree	x	Standard Deviation
1-My private life is negatively affected by my job.	fi Y.fi	59 29,2	15 7,4	66 32,7	34 16,8	28 13,9	2,78	1,38909
2-My job makes my private life difficult.	fi Y.fi	62 30,7	11 5,4	74 36,6	34 16,8	21 10,4	2,70	1,33787
3-I neglect my personal needs due to my job	fi Y.fi	58 28,7	48 23,8	28 13,9	40 19,8	28 13,9	2,66	1,42666
4-I have to suspend my private life because of my job	fi Y.fi	38 18,8	30 14,9	63 31,2	43 21,3	28 13,9	2,96	1,29438
5-I miss important personal activities due to the intensity of my job.	fi Y.fi	46 22,8	11 5,4	46 22,8	62 30,7	37 18,3	3,16	1,41000
6-I make an effort to balance my work and non-work responsibilities.	fi Y.fi	25 12,4	8 4,0	28 13,9	51 25,2	90 44,6	3,85	1,35829
7-I am satisfied with the time I spend on non-work activities.	fi Y.fi	21 10,4	40 19,8	30 14,9	33 16,3	78 38,6	3,52	1,43225
8-My private life consumes the energy required for my job.	fi Y.fi	76 37,6	71 35,1	32 15,8	0 0	23 11,4	2,12	1,24570
9-I get very tired to be successful in my job because of my private life.	fi Y.fi	76 37,6	73 36,1	29 14,4	7 3,5	17 8,4	2,08	1,18950
10-My job is negatively affected due to my private life.	fi Y.fi	119 58,9	49 24,3	20 9,9	7 3,5	7 3,5	1,68	1,02147
11-I find it difficult to do my job because of my personal problems.	fi Y.fi	120 59,4	43 21,3	27 13,4	0 0	12 5,9	1,71	1,09025

12-My private life gives me energy to do my job.	fi	12	13	75	54	48	3,55	1,10130
	Y.fi	5,9	6,4	37,1	26,7	23,8		
13-My job gives me energy to continue my personal activities.	fi	22	63	54	45	18	2,87	1,14747
	Y.fi	10,9	31,2	26,7	22,3	8,9		
14-I have a high morale in my job because of my private life.	fi	0	17	98	48	39	3,53	,89827
	Y.fi	0	8,4	48,5	23,8	19,3		
15-My morale is high at home due to my job.	fi	107	47	28	10	10	1,85	1,13916
	Y.fi	53,0	23,3	13,9	5,0	5,0		

2.4.2. Factor Analysis

According to the factor analysis that is applied to the scale (Table 3), it was seen that the Job-Life Balance Scale is collected under 3 dimensions, as afore mentioned. These dimensions are named as *Unbalance of Private Life*, *Balanced Life (private and work)* and *Unbalance of Work Life*. While the *Unbalance of Private Life* dimension explains the Job-Life Balance Scale with a percentage of 33,185, the dimension of *Balanced Life* explains with a percentage of 22,837 and the dimension of *Unbalance of Work Life* with a dimension of 20,997. The cumulative percentage of all dimensions is found as 77,019.

Table 3. Explained Total Variance

Component	Calculated Sum of Squares			Rotated Sum of Squares		
	Total	Variance	Cumulative%	Total	% Variance	Cumulative%
1	5,306	37,898	37,898	4,646	33,185	33,185
2	2,953	21,092	58,990	3,197	22,837	56,022
3	2,524	18,030	77,019	2,940	20,997	77,019

2.4.3. Comparative Statistics

In order to analyze whether there is a statistical difference between the answers given by the participants according to their socio-demographic characteristics, and the dimensions of the scale, Mann-Whitney U and Kruskal-Wallis tests were applied (Table 4). According to the tests results, it was proved that there is a statistically significant difference ($p < 0.05$) between all demographical characteristics (gender, age, education, experience, department) and all dimensions (unbalance of private life, balanced life, unbalance of work life), except from the *balanced life* dimension and gender and age characteristics ($p > 0.05$). Hence, H1 hypothesis, there is statistically significant difference between the socio-demographic (gender, age, education, experience, department) characteristics of white collar employees in production sector and their attitudes towards Job-Life Balance $h_1: \mu_1 > \mu_2$, is accepted.

Table 4. Comparative Statistics

Variable	Dimension	Test	Statistics	P
<i>Gender</i>	Unbalance of Private Life	Mann-Whitney U	3691,500	,002
	Balanced Life		4629,500	,370
	Unbalance of Work Life		3682,000	,001
<i>Age</i>	Unbalance of Private Life	Kruskal-Wallis	22,677	,000
	Balanced Life		1,835	,766
	Unbalance of Work Life		15,429	,004
<i>Education</i>	Unbalance of Private Life	Kruskal-Wallis	16,195	,000
	Balanced Life		17,328	,000
	Unbalance of Work Life		21,775	,000

<i>Experience in the Current Organization</i>	Unbalance of Private Life	Kruskal-Wallis	15,376	,002
	Balanced Life		11,618	,009
	Unbalance of Work Life		22,765	,000
<i>Department in the Organization</i>	Unbalance of Private Life	Kruskal-Wallis	69,905	,000
	Balanced Life		47,032	,000
	Unbalance of Work Life		29,240	,000

CONCLUSION

When organizations implement specific policies, which constitutes solutions to the family problems and individual needs of employees, employees can create a balance between work and family responsibilities instead of sacrificing one for another, and this balance can decrease employees' perceptions of stress and conflict as well as absenteeism (Goff, 1990; Chang, et al., 2014). Many studies investigating the consequences of achieving a balance between work and personal life for employees reveal that a healthy work-life balance positively affects job satisfaction, job performance, and increased productivity. Employees gain the time they need to train themselves, improving their quality and skills, and this brings along an increase in productivity. The satisfaction of employees in their personal and business life positively affects the organizations they work with, and many organizations expect not only to provide personal value to their employees, but also to increase the efficiency and profitability of the organization with employee-friendly practices (Tosun and Keskin, 2017).

According to the results of the current study, there is statistically significant difference between socio-demographical characteristics of white collar employees in production sector and their attitudes and perceptions towards job-life balance. The fact that there is not a statistically significant difference between gender and age

characteristics and employees' attitudes and perceptions towards the dimension of balanced life of job-life balance scale, can imply that regardless from the gender and age the employees are able to balance their both lives. The results also imply that the participants do not have problems in balancing their private lives and work lives, as mentioned before.

In terms of pandemic and post-pandemic conditions, these kinds of results can be interpreted as "expectation-filled". This is to say that, most of the employees have experienced difficulties in balancing their private and work lives because of trying to adapt remote working and then returning to work place in the post-pandemic time. Thus, it can be inferred that the participants have achieved the keep the balance in this processes.

For further researches, especially during and/or after pandemic situations of employees should be given importance. Because all the professional world have started to act in a new phase and thus, the organizational theories and the results of the previous researches have started to change. Therefore this study is expected to shed light to the further researchers and professional/managers in terms of enhancing their organizations and make their employees feel that they have balanced lives.

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CHAPTER 5

**MARKETING EVOLUTION: FROM MARKETING 1.0 TO
MARKETING 5.0**

Lec. Dr. Mehmet Ozan KARAHAN¹

¹Uşak University, Eşme Vocational School, Department of Office Management and Executive Assistant, mozan.karahan@usak.edu.tr, ORCID ID: 0000-0001-7287-5904

INTRODUCTION

In recent years, the world has been in a state of constant change due to the increased development of information technologies and globalization. The rapid spreading internet technology with smart phones, innovation of artificial intelligence, augmented reality, virtual reality, sensors, robotics etc. all have affected not just the companies or marketers but customers too. The new consumer type wishes more value for the cost of product but also shows socially responsible behavior. Consumers are all well informed due to social media, online bulletins and especially artificial intelligence tools. That's why they have more power than ever and they want to be in the whole process of products and brands with marketers. While the life cycle of product has shortened, being successful among the other companies has gotten harder due to customers' complicated choices and several alternatives. So, the marketers need to observe new approaches and concepts of marketing and the companies have to make even faster decisions to adopt into new marketing framework.

Due to the environmental factors as it's mentioned, marketing has also evolved from Marketing 1.0 to Marketing 5.0. The main goal of Marketing 1.0 was producing standardized ones on a large scaled in efficiency for all kinds of consumers. Because the competition was weak and producing as many as possible was enough to gain shares of market. So, all companies aimed to use benefits of economies of scale and this approach was called product-centric. After Marketing 1.0, the companies had to produce consumer oriented ones due to increased competition and power of consumers. So, importance of the production slid to matter of value fo the customers. The approach was all about to give the value with the spesific products. Marrketing 3.0 was called human-centric approach because of changed responding dynamics of the social environment. All companies tried to show their interest about the social issues at least to help solving some of them. So, they aimed to be in balanced with gained shares of market and responsibility. At the end, this human-centric orientation affected most of the customers positively to be part of these campaigns.

Marketing 4.0 and Marketing 5.0 approaches are really different than the previous ones because they reflect the globalization's strength and digital technology's effects on marketing directly. With the increasing effects of globalization of markets, marketers need to analyze all sources to produce, filter manipulate and distribute the information of consumers. So, traditional marketing has to turn into digital marketing including marketing activities, organizational culture and structure. Within the framework of these new business models and approaches, firstly Marketing 4.0 and then the concept of Marketing 5.0 has appeared for the companies and consumers. Marketing 4.0 contains integration of digital technologies with marketing activities as a new generation approach. So, it's somekind of cybernetic marketing system in which customer behaviors can be observed in real time (Dholakia vd., 2010: 497). Thus; brand engagement, loyalty and retention has become main goals for the companies and marketing strategies has begun to be designed according to the not just stores of the web browser but human-computer interaction too such as the Internet of things (IoT), artificial intelligence system (AIS), robotics, chatbots etc. (Jiménez-Zarco et al., 2019: 2183). Marketing 5.0 approach adds sensors, smart objects to integrate communication with the physical and the digital world. By integrating all smart tools, the customers can feel the physical stores even though they have never been there. While this experience for the customers are providing more specific information, they can also be offered more personal products and services which are cheaper with closer communication (Öz and Arslan, 2019: 247).

The aim of the paper is to help understanding the evolutions of marketing, the characters of all approaches and try to compare these periods with each other till the Marketing 5.0. The main elements of Marketing 5.0 and its effects on all sides of marketing such as customers, marketers, researchers etc. are also tried to be evaluated.

1. MARKETING APPROACHES

1.1. Marketing 1.0

Marketing 1.0 approach was accepted as the first step of marketing due to being product centric. It is noteworthy that industrial revolution had induced to emergence of Marketing 1.0. Therefore, Marketing 1.0 started with production concepts as a result of the industrial where enterprises could produce on a large scaled products (Başyazıcıoğlu and Karamustafa, 2018: 624). Kotler described the Marketing 1.0 as a concept that a company would present standart products for all kind of clients (Rahmat, 2021: 196). This approach expresses an understanding that producers present massive, standardized and undifferentiated form of products to the consumers (Öz and Arslan, 2019: 245).

It's possible to say that the companies did not have any concern to learn either the needs or wants of consumers in that era. The most matter aim was to produce anything as many as possible in a short time for the companies. By being able to produce in a short time, the companies nearly guaranteed to sell them due to the incomplete competition. In this period, during the production process, consumers did not have any influence or effect on companies and even worse they were considered passive by the companies. The basic marketing mix “4Ps” (product, price, promotion, distribution) had been very important as a marketing strategy for the companies and they had thought that basic marketing strategies were sufficient to persuade consumers to buy products (Büyükkalaycı and Karaca, 2019: 466). Using the main marketing communication channel which was traditional media meant that marketing communication was one-way with customers. It was unidirectional through traditional channels (mail, TV, and radio ads) and on advertisements, the companies tried to make customers focus on the functional aspect of the products without considering the aesthetic value (Rahayu et al., 2018: 81). Marketing 1.0 considers product-based marketing and provides customers with functional. Marketing 1.0 concept aimed to produce high quality products that provide benefits in a sense. The basic marketing mix was the 4Ps (product, price, promotion, distribution) as a marketing strategy and it was sufficient to

persuade consumers to buy products (Büyükkalaycı and Karaca, 2019: 466).

As we look at the chronological period of Marketing 1.0, 1950's (post World war two) and 1960's (growing) were accepted two different stages. In 1950's marketing terms such as segmentation, product life cycle etc. were used too much and in 1960's 4P's marketing mix used to provide more effective segmentation and targeting (Mehta, 2022: 475). Since the numbers of companies had increased continuously, the importance of quality products had been much bigger due to competition between companies. Nevertheless, it was not enough for the profit margin and taking advantage of mass production system. That's why the approach of Marketing 1.0 turned into Marketing 2.0 as "consumer oriented" approach.

1.2. Marketing 2.0

Marketing approach and concept has been changed radically and rapidly along with technological changes and Marketing 1.0 transformed itself into an interaction approach. The increased chance to catch a large amount of information and communication, customers had opportunity to have just appropriate information to compare each products with their alternatives. Therefore, the product value was defined by the consumer (Jara et al., 2012: 854). The primary basis of Marketing 2.0 is to combine different types of customers and make them active in the whole marketing process (campaigns, product development) etc. In this approach, the consumers had been active and the communication was between either the company and the brand or between the customers who helps each other during the purchase process (Rahmat, 2021: 196).

It's been accepted by all sides of marketing that consumers are not just interested in searching either the functions of products or services offer. With the help of psychology and sociology, marketing reveal that the emotions of consumers are an important part of the purchase process. Hence, the main perceived value of product/service is all about consumer's individual consideration. The marketing 2.0 was appeared to fulfill wishes and needs of the customers by providing the

optimum value. It's understood that the way making consumers happy and satisfied, depends on answering consumers' needs (Fuciu and Dumitrescu, 2018: 45). Marketing 2.0 also means moving from "transactional marketing" to "marketing as a new approach that can be described as "facilitator. In this marketing concept, customers tend to discovering new target markets that turn into advantageous opportunities (Durukal, 2019:1620). That's why the companies try to make comprehensive search and research on consumers' needs and desires.

According to Kotler et al. (2017: 64) Marketing 2.0 concept had a main goal to match consumers' expectations and retain them by using information technology. While companies were trying to reach this goal, their productions focused not just being functional but also emotional. To understand what customers feel, this approach interacted customers one to one thanks to web 2.0. This technology also helped to analyze their characters and develop sincere bond between customers and the company. So, at this stage is Marketing 2.0 focused on the 4 C's of Communication (clarity, coherence, control and credibility) instead of the four P's. At the end of the Marketing 2.0 stage, the concentration of companies shifted to the emotional benefits of a product rather than functional benefits of products in Marketing 1.0 approach (Mehta, 2022: 477).

1.3. Marketing 3.0

While Marketing 2.0 was customer-oriented to meet the wishes of consumers and aimed to make them active in the process, Marketing 3.0 was called value centered approach which tried to accept consumers as individuals have different opinions, ideas, imaginations etc. (Rahmat, 2021: 196). A communication based on user participation environment has now left itself to a communication environment based on users' collaboration. Emergence of Marketing 3.0 means reflecting collaboration, different types of culture and some spirit for consumers (Kotler et al., 2019: 140).

As being one of the cornerstones of collaborative marketing, transparency and consistency imposed by the new Web 3.0 practices on

entrepreneurs and brands calls for a new environment. That's why all companies have had to collaborate with their customers, employees, partners, and investors (Romdhane, 2014: 140). It's called new wave technology. New wave technologies are described as technologies that lightens the proper mutual affect for the presence of Marketing 3.0 (Warrink, 2015: 4). By using the power of social media, companies began to understand their potential and current customer closer. This factor was so important to create a value based approach for marketers. Producing all kinds of different unstandardized brand, being creative and providing a tight bond with gathering all information of customers were up to the new wave technologies.

Kotler (2010: 4) defined "making the world better place" as one of the cornerstones of Marketing 3.0. The idea for companies was sharing the profit to solve some of the problems which individuals have been interested in to live in a better world as Kotler mentioned. Lots of different examples as companies, e-sellers etc. concentrated to improve their reputation through campaigns to solve social issues (Jara et al., 2012: 852). For example, companies needed to adopt to the sustainable behaviour with their whole organization and employees to enable efficient sustainable business practices and reflect it in their campaigns. The idea behind of being interested in social issues was increasing the brand awareness and image among potential and current customers. Most of the customers have shown willingness to afford high prices for brands interested in solving social issues.

1.4. Marketing 4.0

The dramatic changes between companies in global competition, more conscious and more demanding consumers thanks to the new technologies and innovations, Marketing 3.0 shaded into Marketing 4.0. So, Marketing 4.0 has been a big actor of the information technology that connects both online and offline communication between products/brands and consumers (Kotler et al., 2019: 155). Nowadays, internet technology let organizations access different types of information which has been also catalyzer for customers' decision processes. According to this fact, there are several

organizations which try to set information systems up to be successful at reaching orders and integrate all parts of organization for using the customer data perfectly like CRM (Jiménez-Zarco et al., 2019: 2176). So, to be able to store all the specific information of customers and use it to interact between brand and customers, makes all companies more competitive and ready for the Marketing 4.0 approach.

The acceleration of product life cycles and the shortened planning time frames, organizations must adapt quickly for this business work-flows. Marketing 4.0 differs in terms of timing, talent management, data and analytics, degree of centralization and marketing organization models (Vassileva, 2017: 49). Except the digitization effect, Marketing 4.0 is defined as Big Data Marketing that provides to figure out intentions and acts of consumer. The concept aims to build specific and personalized actions after observing consumers' experiences (García-Haro et al., 2021: 1681). For taking advantage of Big Data technology, many best-in-class marketing organizations act more like technology companies, using agile techniques which are typical for software development to speed up their marketing activities (Vassileva, 2017: 49). A big example of this process is branding. Branding strategies can be gone further by selecting and filtering the customers' information. It's so much matter for market professionals to offer personalized products and try to provide better customer shopping experience during their purchase process. It also provides better customer engagement for the companies which aims to make Marketing 3.0 concept work (Jimenez-Zarco et al., 2019: 2189). While Marketing 4.0 helps companies to give unique brand positioning resulted by succesful differentiation, it also results as having positive andweel known brand image and brand reputation (Jara et al., 2012: 855).

Marketing 4.0 approach blends the machine or artificial intelligence to other ITC technologies to increase productivity and leverages the connectivity between customers during the process of communication (Fuciu and Dumitrescu, 2018: 45). Specifically, the Internet of Things (IoT) and the Web of Things (WoT) both are important sources to leverage this interaction process. IoT is called as a

new cornerstone, which is accessible for all stakeholders in any place at any time (Jara et al., 2012: 853). The main target of the WoT is to reach anything in the physical world and then show them in the internet sites (Faheem et al., 2019: 185028). The main aim is providing healthy social relationships and connectivity with customers. Once companies get successful to be close to customers and connect with them sincerely, it's easy to set up new IT systems and organizations for Marketing 4.0 approach.

As we compare Marketing 4.0 approach with Marketing 3.0, it is exactly not just an upgrade version of Marketing 3.0 but an evolution. Marketing 3.0 has appeared with the new IT developments, effects of globalization and new kind of conscious individuals who like reflecting their spirits, values and personalities. Marketing 4.0 has been an answer in a new business context with the integration of technology in both companies' and customers' lives.

1.5. Marketing 5.0

According to Kotler et al. (2021: 21) Marketing 5.0 is the application of technologies that copying human mainly to provide value as customers want and need. Although conscious consumers are keen on using technology, it is important for marketers to create the long term connection with customers via the technology. Still, difficulties appear obviously for the marketers. As Kotler mentioned in his book "Marketing 5.0: Technology for Humanity" there is generation gap problem for the marketers. There are six generations whom have been classified as veterans (1920-1939), Baby Boom (1940-1959), Generation X (1960-1979), Generation Y (1980-1994), Generation Z (1995 to 2010) and Alpha generation borned after 2010 (Kim ve Ammeter, 2018: 3). Generation X generally avoids to take risk and prefer well-known brand due to the past experience and the attachment to brand. So it's not easy for them to be part of online purchase. Generation Y is generally ready to take risk to maximize their choices unlike Generation X. They are also less brand driven and have enough knowledge on online shopping (Bargoni et al., 2020: 141). Generation Z is ready to be part of the environmental campaigns and volunteer to

support social activities of companies. Therefore, understanding such group of young consumers is very critical to predict their attitudes and behaviors (Le et al., 2022: 2).

Economic crisis has been deepened after the effect of Covid 19 Pandemic for all companies. According to Kotler et al. (2021), the middle class has been slowly vanishing due to economic crisis and the markets are becoming polarized as low-priced but functional and valueable products has gotten some respect towards luxury products/brands. So, Marketing 5.0 approach have a chance to solve this challenge too by providing not just personalized but personal information via artificial intelligence, natural language processing, internet of things, sensors, robotics, augmented reality, virtual reality etc. (Kuryliak, 2022).

The Next Tech which is used for Marketing 5.0 approach gives chance to companies to access to Big Data and provide to find out users' wishes, needs and abilities from several resources. Hence, the expected results of marketing campaigns and strategies can be predicted. Also, digital experiences are possible that are brought into the physical sphere and the value aquired with the speed of artificial intelligence makes customer satisfied ("Marketing 5.0 and understanding modern marketing lessons", E.T. 02.11.2022)

For providing the value needed, the approach contains artificial intelligence and its implimentations such as natural language processing and internet of things, sensors, robotics, virtual reality etc.

1.5.1. Technologic Tools Of Marketing 5.0

Technology for humanity is the capture of Marketing 5.0 approach. So the next tech is the key for this concept. Artificial Intelligence System (AIS) and all technological tools boost the customer engagement and provide customers experiences that they wish to remember and let them happen again. One of the function of technology in the Marketing 5.0 is providing personalization. It provides interactional communication by analyzing, processing and delivering data (Bansal et al., 2022: 137). Data driven analytics and

provided insights of customers create valuable results to predict their approaches, intentions and finally behaviour of purchase.

AIS tools such as chatbot help the companies to interact in real-time. While the system makes the communication earlier and faster, it also provides data to be analyzed and contains logical offers to be decided by the customers. The real-time interaction has become so much important in Marketing concept to make difference with the concept of Marketing 4.0. Answering questions, guiding the customers when they need help brings positive experience for them. The aim in Marketing 5.0 approach is also not to neglect the human feelings by using just high technology.

The aim for the retailers is to match and combine technologies to provide physical and online stores experiences for customers. The technologic tools such as smart screens that provide interaction or devices that provide product visualisation are part of augmented reality and virtual reality applications (Bonetti et al., 2018: 119).

1.5.1.1. Natural Language Processing

The term of natural language is described as any spoken, signed or written symbolic communication. Natural language processing (NLP) focuses on either computational linguistics or human languages to make speech recognition within synthesis and sentiment analysis and is a highly interdisciplinary (Darwish et al., 2020: 72). NLP is the process of converting human language into structured form that a computer can understand. It helps to interpret language to decide the customer requirement by overcoming difficulties of syntax and mispronunciation. Furthermore, companies might interpret behind of the dialogues of customers and make more relevant strategies based on these analyses. (Bansal and Pruthi, 2022: 135). To Understand natural language is a really complicated issue for individuals and contains many stages of processing and a variety of subtasks. Morphological processing, syntactic processing, named entity recognition, dialect identification are all some difficult tasks for NLP (Darwish et al., 2020: 80). NLP has got components of speech recognition, spoken-

language, syntactic, semantic and discourse analysis, information extraction and machine translation (Brill and Mooney, 1997: 19).

Speech recognition let artificial intelligence to analyze what the spoken words mean. The companies use AI speech recognition, can monitor and analyze all customer calls or dialogues by either call-center services provider or computer programmes (Kietzmann et al., 2018: 264). Also, speech recognition engine is used to transform sounds into words. By using the different applications of language model the system can predict what will be next word in a speech (Kaličanin et al., 2019: 476). It is a big part of process for companies to boost customer satisfaction and lead in competition between the other companies. The applications of Apple's Siri, Nuance Communications' speech recognition engine, the assistant system of Google are the examples of speech recognition (Wirth, 2018: 437).

Syntax refers to the relationship between word units from analysis of phrases, clauses to sentences. *Syntactic analysis* provides to parse representation for any sentences that shows the relationship among its words (Darwish et al., 2020: 79). By syntax analysis, it's possible to make sentence and token classification where text is synthesized into predictions (Tunstall et al., 2022: 122). Syntactic analysis provides to understand users' emotions and expressions truly. Because cultural difference may sometimes affect the syntax differently and cause misinterpret the sentence. It will also help to determine opinions and provide better insight into individuals' true emotions and feelings (Maulud et al., 2021: 21). Still, NLP is not a flawless technology to help out customers. It can make errors due to linguistic grammar problems or misinterpret sentence or clause by just translating vocabularies mode to mode. By using some complex network analysis such as knowledge-based systems with arbitrary text and machine learning solutions, better results may happen (Maulud et al., 2021: 23).

Semantic analysis helps the companies to understand their customers better and make some personalizations with a text-mining tool from different data sources such as surveys, social media accounts, forums, articles etc. It provides the current sentiment score (Bansal et al., 2022: 134). This analysis type is so important for the marketers to

make strategies and campaigns for their customers. By getting closer with the customers, it's easier to make them satisfied and prevent any negative situations. Another analysis type *discourse analysis* is a part of NLP which presents linguistic structures from texts such as identifying the topic or the conversation structure for discourse. These structures can help system to inform text summarization, answer any questions or help to analyze sentiment analysis (Joty et al., 2019: 12).

1.5.1.2. Internet of Things (IoT)

IoT is described as a global network provides interactive communication between human-to-human, human-to-things and things-to-things. It creates a magic world where just anything can be connected each other and integrated in terms of electronic devices such as computers, smart phones etc. (Madakam et al., 2015: 165). The main aim of IoT is to let smart devices use embeded unqiue information to be analyzed and evaluated by marketers (Farooq et al., 2015: 1). Another definition for IoT is a comprehensive network of smart objects which provides to share information and react and act due to enviromental situations (Madakam et al., 2015: 165). IoT development in marketing field is such a technological revolution that creates the opportunities for data collection, processing and distribution. It helps marketers to transfer data into information or knowledge (Miskiewicz, 2020: 371).

IoT has got several benefits in marketing. It can make dynamic pricing with the digital provide to maximizing sales and eliminate the products out of expiry time. QR codes or RFID can help to follow all the path the products that are taken from any place and reached to the customers (Bölükbaşı, 2021: 11). IoT with RFID provides many advantages to retailers. With Radio Frequency Identification (RFID) equipped products, a retailer can easily track the stocks and detect shoplifting. It can help following all products in a store and keeping them in safe. It also helps placing the order automatically and turn out the graphics of sales to develop effective tactics (Farooq et al., 2015: 5). The feedbacks on products especially in social media is a great key to develop these strategies. It helps companies to learn the interest and opinions of social media users. Hence, providing spesific information

for each social media user and making social media users center of the developing process is already a routine for Marketing 5.0 approach. Combination of IoT technologies and social media merge can help to create a virtual environment where the users will either order products or make the products modify by the companies due to their wishes (Abashidze and Dąbrowski, 2016: 218).

IoT is a concept including the wireless sensors, robotics and data storage interconnected by the Internet. Thus, any IoT-enabled device can transmit, store and process the data gathered and act accordingly. The true smartness of an IoT service will have AI and may serve the actual goal of automation and adaptation (Ghosh et al., 2018: 211). *The wireless sensor network* monitors the physical conditions of the environment. It is defined as a group of spatially distributed sensors to monitor and record and organize collected data in a central location (Zengin and Zengin, 2021: 86). The whole system of the wireless sensors provide interactive communication and connection between each component of the system. Hence, it helps passing information from one object/system to another (Ghosh et al., 2018: 212). *Robotics* is defined as using robots or actuated systems as a medium for human-computer interaction. All actuated tangible interfaces, shape-changing interfaces and adaptive environments are tools of robotics systems (Suzuki et al., 2022: 2). Robots are used in different fields including marketing to automate tasks, reduced labor costs with exceptional ability and intelligence. Advances in interfaces and sensors with better materials and ergonomic design. Enduser industries are rapidly adopting robots for industrial purposes to improve the quality of products and reduce manufacturing costs too (Ulas, 2019: 666).

1.5.1.3. Virtual Reality

Virtual environment and virtual world terms are often being used for VR. Virtual environment is related to software representations of real (or imagined) objects, processes and a human-computer interface for displaying and interacting with these models, while virtual world provides simulated spaces shaped by their inhabitants as avatars (Wohlgenannt et al., 2020: 456). So, virtual environments and virtual

worlds both terms are all about the software that have a chance not be based on virtual reality. The common point of definitions of virtual reality is interactio between computer systems and people. The important part of VR is the degree of being isolated from real world and included in the realm of imagination. If a person feels himself/herself in a new world and gets ready to live the virtual experience, it can be said that the VR application is successful and effective. VR is defined as interactive computer simulations which increase to obtain information of individuals' actions through feelings. It provies a virtual world that users feel themselves as being psychologically submerged in (Bonetti et al., 2018: 120).

By using VR, companies can make social-psychology experiments and they can have the chance to generalize results to discover new marketing strategies. Shopping malls with 3D technology can help to access customers and provide interactions in vidual atmosphere such as avatars. Some of VR applications are used either for marketing research, virtual product sales or predictions on consumers in physical stores (Alcañiz et al., 2019: 3). VR systems provide a standardized and reproducible environment. Also, most important thing for users is the viewpoint of a virtual environment can be adapted in real time to correspond to the subject's one. At the end, it provides joyable experience session that increases the motivation of individuals (Morel et al., 2015: 318). Consumers have a chance to feel experience the product without physical location. This gives communication route to deliver high-impact messages and engaged potential consumers (Barnes, 2016: 4). For retailers, it becomes possible to understand the reactions of consumers' on price and all the visional characters of products like package, label etc. The value of the virtual experince is so much matter that may surpass the physical reality situations.

Even though the digital marketing rises up rapidly with the enabled technology, it would be said that VR systems are not exactly flawless. The most common problem for the VR systems is gathering information and providing the multidimensional feedback. It takes a lot of time to provide them and there's a big chance that the image would

be delayed too (Morel et al., 2015: 318). Social interaction is another disadvantage for the companies because by using VR technology, it is not possible to interact due to the lack of eye contact. Also, virtual reality technology is expensive for the marketers to bring for each customer so it's also not easy to create either the physical environment or provide a healthy experience. As of now, in terms of the consumer market, virtual reality headsets are far from being a device used by early adopters of technology (Mealy, 2018: 119).

According to Barnes (2016: 4) technological, individual and emotional factors affect the consumers' virtual reality experience. Technological factors refer to delivery system which contains data structure, software and hardware. The technology helps consumer to feel as a part of organization by executing either personalized concepts or campaigns and joyable games. Individual factors are all about situational and psychological ones that affect customers' virtual reality experience directly. And last one emotional factor is all about providing engagement with customers by interacting in real-time, helping them to solve their problems such as service support or the purchase process.

1.6. The Components Of Marketing 5.0

Internet technology and social media have helped to build a new type of consumption society who gives lots of credit to brand names, images and what the other consumers interpret about brands or what they prefer purchasing. Hence, the consumer behaviour has changed dramatically and it has been quite much harder to predict intention of individuals. In addition artificial intelligence systems have begun to be used for Marketing 5.0 approach that gives chance to companies to access to Big Data and provide to learn from multiple sources to understand human cognitive abilities. Marketing 5.0 is built upon the human centricity of Marketing 3.0 and technological prowess of Marketing 4.0. It is defined as the use of human-mimicking technologies to create, communicate, deliver and enhance value in the overall customer experience. It starts by mapping the customer journey and identifying the marketing technologies can add value to improve the performance of human marketers (Sima, 2021: 5). Hence, the expected

results of marketing campaigns and strategies can be predicted. Consumers' data have been available for marketers to be analyzed and provided opportunity to develop individual and specific products/services too. Active social media users have helped marketers to obtain the big data to present the optimum value and provide marketers to learn about communities who like participating the whole process of product developing, promotion etc. and being volunteer ambassador of the brand.

With the AI technology, personalization and real-time presentations have been possible for marketers. Offering personalized products/services via IoT marketers (Shamsuzzoha and Raappana, 2021: 8), providing the strategic integration of virtual experiences with brand-related cues (Rauschnabel et al., 2022: 1141), defining how to add value to marketing activities and with the changing environment the companies all have caused to get closer to Marketing 5.0. It can be said that marketing communication will be also changed radically with the IoT and AIS. Marketing campaigns will not be based on vague hypotheses and predictions but will be based on valid data, predictable behavior and known habits. Thus, ineffective and expensive promotional activities of the business will no longer exist (Öz and Arslan, 2019: 253). Marketing 5.0 approach through five components has added some new and essential marketing concepts. They are data-driven marketing, predictive marketing, contextual marketing, augmented marketing and agile marketing (Kotler et al. 2021: 28).

Today, the focus of modern marketing has shifted from the products/services to customer experiences. Companies aim to improve the connection between brands and consumer. It's already an obligation to make consumers as a member of their companies to sell their products. Hence, AIS helps companies to be customer-centered by providing them unique, personalized and enjoyable experience. Consumers feel that they are one of the main cornerstones of purchase process which they participate and affect it actively. Creating virtual world and combining this virtual world with physical one helps customers to feel the real-time experience and force companies to embrace Marketing 5.0 concept with developing technology.

1.6.1.Data-Driven Marketing

When it's looked at data driven marketing, it's seen that the approach goes back to the fifties. The aim for the both marketers and researchers was shifting descriptive marketing to predictive marketing by using optimization such as optimization of sales routes, optimal allocation of advertising budgets, location of warehouses or optimal distribution of products to retail outlets (Sheth and Kellstadt, 2021: 780). Although data-driven marketing is not either new or has begun to be executed right now, companies are increasingly trying to analyze and interpret the large amount of data generated by digital conversations with customers. In the modern world, consumers are more powerful than companies because they all have been authorized by advanced technology so modern marketing approach has to obtain the feedbacks of consumers who loves declare share their ideas, comments and even offers about the products, brands or organizations. Also, the competition among companies has increased and opposite of this, brand loyalty has decreased due to alternative products/services. Hence, it's an obligation to access the consumers as being customer centric and provide the optimum value to them. Data-driven marketing tries to execute all plans and strategies for companies by obtaining adequate information about both consumers and the sector.

Data-driven marketing aims to collect all data of customers from either online or offline sources. After storing it, analyzing the filtered data and gaining useful approach to present personalized products for the customers and strategizing the customer needs brings the success for the marketers (Shamsuzzoha and Raappana, 2021: 8). Digital channels help companies to store a large amount of data on customer interactions with the company as well as with other customers. Computer-tracked systems, points of sale systems can be used as the source of data. Also, marketers need all departments' contribution to obtain and use data for collaboration (Micheaux and Bosio, 2019: 129). The feedbacks and consumer reactions are so much matter for marketers to succeed their strategies after they use these data to measure with some metrics. Yet, the main information source comes from customer insights taken from these

information sources (Shamsuzzoha and Raappana, 2021: 7). Because the data-driven approach has aim to create value for customers and build relationships to make them satisfied. All the marketing mix decisions must reflect the insights of customers.

Even though the companies can collect all detailed information about customers and manage their marketing strategies due to these information, organizations may still face with chaos. All data which is obtained from various sources, may cause some problems to be classified due to right functions or strategies. The most difficult issue for data integration is to catch a common point after filtering all data sources. Ideally, companies can combine data into a single marketing segment to integrate at the individual customer level by allowing good record keeping applications (Kotler et al., 2021: 139). Also, companies should take care of collecting and ensecuring the data. By this way, they can have unlimited data of consumers. The privacy concern of consumers cause some probems while companies tend to provide data protection. Sharing information with other parties either decreases engagement with the company or brand value and trust (Shamsuzzoha and Raappana, 2021: 8).

1.6.2. Predictive Marketing

This component is all about the usage of analytics to make predictions about severall processes of marketing. It's so much useful to save time and decreasing the companies'expenses while creating strategies. It is much more than observing the frequency statistics about past results and finding out the cause and effect behind them (Tanase, 2022: 36). In order to execute predictive marketing strategy, marketers must have the ability to analyze huge data sets to provide insights into consumer behaviors. AIS is the main factor to produce the filtered data and then predict meaningful results with efficiency from them. AI tools can easily interpret and anticipate customer preferences due to their shopping experiences. THE collected data have been transformed into information and the obtained and filtered information helps marketers to predict next purchase pattern for the customers specifically. AI povides the the best choice to interact with customers by analyzing

large unstructured data samples in a fraction of the time. The system helps in automating decisions regarding when and how to reach customers, when to use bot for interactions and when to use an agent. AI-enabled chat-bots can proactively start conversations with customers and deliver information (Bansal and Puthi, 2022: 138). Including regression analysis, collaborative filtering and neural networks.

Collaborative filtering, regression analysis etc. are some of popular predictive marketing modeling techniques. To build models based on predictions, estimation machine learning or artificial intelligence would be used. That's why most marketers, statisticians will require technical assistance from scientists. However, marketers should develop a strategy to find out which models work or what kind of insights are matter for them (Aydin, 2022: 36). It is not an easy task to make huge leap on companies' organization, operation and growth. This prediction process presents key factors to find optimum price and profit level, stock level, modification situation of the product when it's needed, the concept of campaigns etc. It is also useful to inrease the value of products and safe to say that customer management, product management and brand managment all need the concept of predictive marketing.

The customer- company relationship and engagement is one of the cornerstones for Marketing 5.0. Thus, marketers need to predict the length of relationship, amount and types of products and amount of payment with each customer. Predictive marketing is a customer oriented approach which helps marketers to improve strategy and provide detailed segmentation for the market. By obtaining the information from several sources such as sales-person, social media, surveys, observations etc., the approach manages whom will be visited and communicated with and how will be the offers? Predictive analytics can determine customer loss and help to find out the real reasons for it. By this way, marketers can find solutions to prevent customer loss and turn potential customers to current customer based on lifetime value (Tanase, 2022: 36). Marketers can also predict which segment prefer which brand and is likely to buy or what chance they

have to lose customer's interest in a particular brand and/or product by calculating probability scores of individual customers for the certain brands (Kotler et al., 2021: 144).

1.6.3. Contextual Marketing

Today, the competition between companies are even tougher than ever. Lots of alternatives of products, brands, dynamic online purchase process, the risen up consciousness level for consumers, interactive platforms such as blogs, portals, social media etc. affect the marketing approach for the marketers. To take the advantage of personalization and real time service, marketers make their strategies and try to execute their campaigns with the contextual marketing approach. The things that consumers like or dislike under the environmental circumstances such as economical, social or demographical helps marketers to obtain contextual information in real-time. This is the aim of process to make customers feel that they are active and change some details even in new product development or concepts (Buhalis and Sinarta, 2019: 564). Hence, contextual marketing refers to personalization and real-time presentations. By executing the concept, the companies are able to offer personalized product and service offers over IoT-connected devices and objects in real-time and with the changing environment (contextual) (Bölükbaşı, 2021: 12).

The real time term in marketing is directly linked to contextual marketing. It helps companies to affect their customers immediately either with advertisements, discount of price or raffles etc. It also provides essential information to be collected and interpreted by marketers for the personalized campaigns in the near future with efficiency. After all, targeting the right groups of customer within real-time and executing marketing strategies on online platforms as a part of contextual marketing, provides to minimize latency and disruption in. Hence, the aim in contextual marketing is providing real time decision making and increasing unplanned purchasing. According to Buhalis and Sinatra (2019: 566) real-time marketing provides personalised and spesific products/service due to real time engagement with customers. It helps to create customers to participate to the process of marketing

facilities and have experiences real-time marketing. So, companies have to execute big data mining and use artificial intelligence systems in real-time.

As it's obvious that real-time marketing can occur on online platforms or mobile applications, it is a big part of contextual marketing to provide key factors on customers. The system helps marketers to follow the customers' search, movements and target (Tong et al., 2019: 66). By this way, marketers can find out customers' cross-channel shopping behaviors and experience with omnichannel. Brand events such as product launches or conferences and anticipated events let companies to act fastest in real time. For example, Starbucks prepared locationbased and contextual-based promoted tweets to offer a hot coffee when a snowstorm hits North America. Yelp partners with business owners to offer personalised deals based on user's locations and check-in action via app, all in real-time (Buhalis nd Sinatra, 2019: 567). Anoter successful exaple was the marketing team of Nike. They searched to find out interests and intention of customers through social media and found out that teams of Nigeria, France, and Brazil were popular before the 2018 World Cup. So, they designed personalized campaigns for different ages and regions through the deep insights of customer profiles and shopping interests. The Nigeria team collection jersey was sold out within 3 hour after release (Tong et al., 2019: 66).

1.6.4. Augmented Reality Marketing

As Kotler et al. (2021) defined in his book, the generation gap makes marketers' business more difficult and prevent them to predict any consumer behaviour without making mistakes. Today, most consumers especially young consumers tend to use the social media, smart phones or any tools which make their lives easier and more comfartably. Hence, the virtual wold is so much matter for them to reflect their limitless freedom and feel the innovation to have the unique experience. Augmented reality marketing helps companies to integrate both physical and virtual world to execute their marketing strategies. AR combines and blends the real and virtual environment in such a way they appear as one environment through a virtual layer that

can add images, textual information, videos or other virtual elements to the user's viewing of physical environment in real time. By using devices such as smartphones or tablets and wearables (headsets), AR can provide a creative and innovative way to capture consumers' attention by enabling them to interact with virtual products (Bonetti et al, 2018: 119). Therefore, AR helps to increase brand awareness and value by enhancing consumer engagement and persuade customers to purchase products. It also provides to access experiences without time or space limitations for the customers (Wang et al., 2021: 112). Meanwhile, it provides several opportunities for marketers to observe customers' intentions and behaviors and make judgement about their shopping experiences. The visualisation and image of products in a mixed environment may help customers to beat indecision situation and encourage them to make shopping.

When it's searched the timeline of developments in AR, it's seen that the cronology begins from 1980's and goes on till now. As Alcañiz et al. (2019: 4) explains the history, in 1980's positive user acceptance of virtual 2D stores was the main result for AR till 1990. In 1990's positive influence of dynamic 3D models on brand attitude, product knowledge and purchase intention and exploratory uses of augmented commerce were seen with AR applications. In 2000's AR was used as a new advertising/communication channel, virtual product sales and marketing research. Finally after 2010, it's been used to show the influence of 3D virtual stores on consumer responses such as ease of use, enjoyment, store perception, and consumer satisfaction.

AR is the strategic integration of virtual experiences with other media or brand-related cues. The goal is to create value for the brand, stakeholders in ethical applications (Rauschnabel et al., 2022: 1141). Collaboration of humans and machines will give the best result in augmented marketing. In augmented marketing, the strategy begins to define how to add value to marketing activities when the companies encounter customers. One way to increase efficiency is the creation of the interface system through a layered. These interfaces are digital and human and using these interfaces in different steps will help companies grow (Aydın, 2022: 39). Another aim of AR is producing value for

customers. It provides utilitarian (e.g., improving people's efficiency), hedonic/experiential (e.g., engaging brand stories or games), social (e.g., connecting with other brand fans in multi-user AR or anthropomorphized brand mascots), eudaimonic (e.g., improving wellbeing or personal growth), inspirational (e.g., fostering imagination or inspiration), or edutainic (e.g., gamified learning experiences or the feeling of being more competent consumers) value (Rauschnabel et al., 2022: 1141).

1.6.5. Agile Marketing

Digital consumers try to execute specific marketing activities via social media, mobile communications, clouds. The reason behind being a digital consumer is either having customised and personalized products/service or owning opportunities to compare all kinds of brand with any chosen criteria. Moreover, customers wish to access any product or service in any time even in real time. So, companies need to be as agile as possible to access true type of customers which have high chance to purchase. They need to provide flawless communication to understand customers' specific expectations by using online platforms. And while companies are interacting with their customers, they also have to make customers' experiences fun, joyable and emotional. Then, it will help them to have satisfied consumers who have brand loyalty. Agile Marketing aims to survive in the competition by speeding up and observing the complexity of modern marketing. It is a cross functional activity between different departments to catch marketing opportunities and change strategic marketing plans. It is also a tactical marketing approach to publish content as quickly as possible (Gera and Mishra, 2019: 40).

According to Pettersson (2021: 10), agile marketing has got five values that companies need to take care of:

- Focusing on customer value and business outcomes: One of the cornerstone of agile marketing is providing functional and symbolic value for the customers. It's also matter for brand awareness and value which helps companies to gain return of investment (ROI) earliest and measure their

business outcomes. Acting earlier and reacting customers' wishes is part of the process of agile marketing.

- Delivering value early: Long-term marketing success depends on operating at a sustainable pace. The satisfaction level of consumers do not just rise up with the quality, design or function of the products but also having their orders as soon as possible even in real time makes them happy and satisfied
- Learning through iteration and data: Companies can execute better results with high tracking performance that perform repeating tasks by learning from past data such as Iterative Learning Control (ILC) (de Rozario and Oomen, 2019: 342).
- Utilizing cross-functional collaboration: The companies which performs higher levels of cross-functional collaboration can explore environmental collaboration opportunities fully. Thus, they can integrate functions such as supply chain and the demand-related elements of environmental issues and respond to changes instead of excessive planning (Gölgeci et al, 2019: 238).

The process of agile marketing begins with setting of goals which must be specific, measurable, relevant and timely. Hence, companies can achieve objectives. Establishing key factors is the next stage for the concept of agile marketing that marketers can have metrics to test its launch and know what kind of changes are required in next iteration (Gera and Mishra, 2019: 41). Developing persons is another step for marketers. It means that true customer segmentation and long relationship with the customers can help companies to develop the marketing strategies as they are part of process. This marketing strategy must be long termed but the activities of this strategy must be as fast as possible on online platforms.

Agile marketing increases the productivity, effectiveness, transparency and adaptability to change. It's about making quality work. Marketing teams can reveal their activities quickly and then make some changes due to their performance (Pettersson, 2021: 31).

Among the dimensions of agile marketing customer-oriented responsiveness, high flexibility, collaboration, fast and continuous development, especially in turbulent and rapidly changing situations, help marketers to explain how their skills can be developed and be agile in marketing (Aydm, 2022: 34).

2. CONCLUSION

The companies have to find ways to adapt to the dramatic changes in marketing to create a sustainable competitive advantage. Today's marketing approach skips from traditional one to the digital one. The Marketing 1.0 approach was aimed to provide production efficiency and product development to have shares of market. Marketing 2.0 which is characterized as customer-oriented, aimed to create efficient brand communication with customers and focused to create positive brand experiences among them. Marketing 3.0, described as a value oriented approach focused on social responsibilities and Marketing 4.0 created a digital marketing approach with many subsets of marketing strategies such as viral marketing, content marketing and community marketing etc. Finally Marketing 5.0 tries to make collaboration between humans and machines to create a new system. The aim of this study is presenting the evolution of the marketing from traditional marketing "Marketing 1.0" to today's digital marketing "Marketing 5.0" and take a closer look at the Marketing 5.0 concept.

In Marketing 5.0 machines and humans collaborate together to provide superior social, economical, ecological values and positive experiences. By using smart machines, marketers try to create impressive experiences and successful brand engagement. Yet; technological advancement, high speed and agility marketing strategies are not quite successful. To provide positive experiences which enhance relationship between customers and brands and tighten engagement, marketers need to concentrate human feelings more and embrace Marketing 5.0 approach. It's obvious that this approach is new for customers, companies and researchers so trying to understand the main idea of this new concept and observe the customers and the effects of

smart technology implementations has been an obligation but not choice. As the studies on Marketing 5.0 are categorized, there are mainly 3 groups. Marketing 5.0 and AIS (Artificial Intelligence System), Marketing 5.0 on marketing communication (mainly green marketing) and Marketing 5.0 on Brand management. So, this study tries to give some recommendations for either researchers to study and concentrate on issues of Marketing 5.0 or marketers to fulfill the expectations to provide values for customers and make them satisfied.

Today, there is a sustainability vision in the Marketing 5.0 era for both companies and consumers. All companies try to have sustainability in the business world in the long run while consumers sees it as the existence of the environment and social well-being in the long term (Avcı and Uygur, 2022: 61). That's why marketers need to concentrate on sustainable marketing more with Marketing 5.0 concept via social, or ecological value. It's also the same for the academicians studying on Marketing 5.0. They need to observe the effects of sustainability on customers and their priorities about social and ecological values (Improved energy and material efficiency, increased use of renewable energy sources, reduced use of toxic materials) which also the big cornerstone of Marketing 5.0 concept.

Marketing 5.0 and ethic is also another research area for both marketers and academicians. While AIS is helping companies out too much to combine virtuality and reality in real time and provide positive experience, it's also a big concern for customers to be deceived easily with high technology as sensors, robotics etc. and not to be able to resist any offers during the purchase process. So, the campaigns of the companies must be transparent, informative and understandable for all kind of customers. Thus, the studies on customers' experience on Marketing 5.0 and brand management especially brand awareness, love, image, engagement can increase and be more meaningfully.

The collaboration part of Marketing 5.0 approach has been also another important issue for both marketers and researchers. Taking part in co-creation and innovation processes, socializing membership in online communities for individuals are the part of collaboration. So, marketers need to make the knowledge learning transfer more easily

and fast. The researchers also need to study on collaboration process more and concentrate the effect of collaboration and engagement between customers and brand. It's also possible to say that brand engagement, collaboration, social media effect between peers etc. have been more common issues in Marketing 4.0 concept for the researchers.

Even though augmented marketing and its applications are so common for the researchers and there are several studies on Marketing 5.0 on marketing communication, lack of contextual marketing based on Marketing 5.0 draws attention easily. Contextual marketing as one of the cornerstones of Marketing 5.0 can be described as identification process for each customer and provide personalization of customers with right message and channel in right time during the interaction (AgusWahyu and Ramantako, 2019: 58). Optimising. Thus, studies about marketing segmentation for certain groups and certain products can help reserchers and marketers to understand Marketing 5.0 concept and predict customers'intention more easily.

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CHAPTER 6

THE ROLE OF MACROECONOMIC VARIABLES ON BIST100 RETURNS: A MACHINE LEARNING APPROACH¹

Assist. Prof. Dr. Fatma Özgü SERTTAŞ²

Dr. Davut ULUÖZ³

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² Ankara Yıldırım Beyazıt University, Faculty of Political Sciences, Department of Economics, Ankara, Turkey, foserttas@ybu.edu.tr. ORCID: 0000-0003-0746-3991.

³ Republic of Turkey Social Securities Institution, Ankara, Turkey, davutulu@gmail.com. ORCID: 0000-0001-6801-5856.

INTRODUCTION

Stock prices are influenced by fundamentals of firms. Prices mirror the intrinsic values of stocks, at least in theory, through discounting future cash flows (profits/dividends). Firm profits are influenced by the economic environment of the firm. Thus, the role of macroeconomic factors such as gross domestic product (GDP), inflation rate, real exchange rate, ...etc. are prominent in determining stock prices. Formulating the behavior of asset returns has been the subject matter of a plethora of studies. Many researchers attempt to explain the stock market return behavior through making predictions out of different complex models. Parametric methods tend to be unduly restrictive since they rely on restrictive linear functional forms, and are subject to misspecification problems (Rossi, 2018).

The analysis of the relationship between stock returns and macroeconomic variables in Turkey is documented in various studies. Many of these studies have used conventional techniques, such as the vector error correction model (VECM), vector autoregression model (VAR), co-integration tests and auto-regressive distributed lag (ARDL) analysis. All these econometric techniques require high levels of statistical sophistication of course. In this research, we divert our approach to utilize the four well-known machine learning techniques: decision tree (DT), bagging, random forest (RF), and gradient boosting machines (GBM) in analyzing the role of key macroeconomic variables on the BIST100 returns. We make regression-based predictions.

Machine learning methods have captured the attention of scholars due to several advantages. By the recent computational advances, currently it is possible to implement complex machine learning algorithms which have good capabilities of prediction. Machine learning techniques are prominent in their ability to deal with many explanatory variables (David, 2017). Now that it has become easier to use these methods; researchers have started making wide use of their abilities in making predictions and generalizations. Especially RF can handle many variables without any assumption about functional form of the relationship and distributions of variables (Sullivan, 2017). Moreover, these algorithms can determine the critical variables based

on their out-of-sample predictive capabilities (Basuchoudhary et al., 2017). Finally, unlike linear models, these techniques capture the non-linear and complex relations between the explanatory and response variables. In fact, in this research, partial response plots (PDPs) have helped us explore the potential non-linear patterns between the macroeconomic variables and return series of Borsa Istanbul.

We have obtained in total ten variables (four global, six country-level data) to utilize the four methods. We also compare the performance (model predictive accuracies) of these methods to that of a fifth method: multivariate regression model (least squares). Our data frequency is monthly from 2006:11 to 2022:01. Brent oil prices, gold prices, Morgan Stanley Capital International emerging markets index (MSCIEF), and global volatility index (VIX) are four global variables. Industrial production index (IPI), real exchange rate, inflation rate, and short and long-term interest rates are country-specific macroeconomic variables. BIST100 index: The Borsa Istanbul National 100 Index (BIST) return series, is the series of concern.

During our analysis, model performances are compared based on the root mean squared error metric. After selecting the best model as RF, variable importance and partial dependence features are plotted accordingly, to compare the impacts of the different explanatory variables on the Turkish stock returns. Empirical results of our study show that MSCIEF, IPI, overnight borrowing rate, real exchange rate, BIST100 series' own lag, inflation rate and gold prices have significant predictive powers on the current stock returns.

RELATED LITERATURE

Before the applications of machine learning techniques, conventional econometric techniques were mainly used in estimations. Among these common methods were the time series techniques. Frequently used methods in literature were the causality tests among macro and financial variables (Granger-causality and Toda-Yamamoto procedures), VECM procedures, and multivariate ordinary least squares (OLS) regression methods. Later in literature, machine learning and artificial intelligence methods had gained specific attention, thus many

studies on the Turkish stock market started implementing different algorithms to forecast the behavior of stock returns based on its past values. Recently, by 2010s, machine learning and artificial intelligence applications on the Turkish stock market (Borsa Istanbul or BIST)⁴ had shifted towards modeling the BIST indices through a variety of macroeconomic variables.⁵

A spectrum of conventional time series methods was used in early works. Acikalin et al. (2008), for example, employed co-integration tests and VECM using quarterly data between 1991 and 2006 to point on the long-term stable effects of GDP, exchange rate, interest rate, and current account balance on BIST100 returns. The long-run causality ran from macro variables to BIST100 index but not the other way around. Aydemir & Demirhan (2009) investigated the causal relationship between exchange rate and stock indices of Turkey, using daily data from 23 February 2001 to 11 January 2008 by implementing Toda-Yamamoto procedure. They showed a bi-directional causal relationship between exchange rate and all stock market indices (BIST100 index, services, financial, industrial, technology). Buyuksalvarci & Abdioglu (2010) also explored causal relationships via Toda-Yamamoto procedure between the BIST100 index and macro variables: foreign exchange rate, gold price, broad money supply, industrial production index, and consumer price index using monthly data from March 2001 to June 2010. A unidirectional long-run causality ran from stock prices to macro variables.

In addition to applying Granger-causality tests, Aktaş & Akdağ (2013) estimated multivariate regression models for monthly data between 2008 and 2012. BIST100 was taken as the dependent variable and deposit interest rate, consumer price index, USD/TRY exchange rate, EUR/TRY exchange rate, unemployment rate, industrial production index, export, capacity utilization rate, gold price, consumer confidence index and crude oil price were used as independent variables in the regression analysis. The study found a bi-directional

⁴ Istanbul Stock Exchange (ISE) has been named Borsa Istanbul in 2013.

⁵ These studies are mostly classification studies. See for example Aydin & Cavdar (2015), Filiz & Öz (2017) and Kartal et al. (2020).

causality between deposit interest rate and capacity utilization rate with BIST-100, and only deposit interest rate, consumer price index, USD/TRY exchange rate, capacity utilization rate and consumer confidence index had been shown to have effects on BIST-100 as explanatory variables. Tursoy et al. (2008) implemented multivariate linear regression models of 11 industry portfolios of Borsa Istanbul on money supply (M2), industrial production, crude oil price, consumer price index, import, export, gold price, exchange rate, interest rate, gross domestic product, foreign reserve, unemployment rate and market pressure index. The regression results revealed no significant pricing relations between the stock returns and macroeconomic variables. Erol & Aytakin (2019) also applied multivariate linear regression of BIST 100 index as the dependent variable, on inflation, overnight lending interest rate, gold price, industrial production index and growth rate by using quarterly data from 2009:4 to 2018:3. Statistically significant impacts of overnight rate, industrial production and inflation rate were observed, yet growth rate and gold price did not have any significant effects in the regression.

Altınbaş et al. (2015) studied the impacts of inflation, interest rate, exchange rate, industrial production index, and oil price on the BIST100 index between 2003:01 and 2012:07 using Johansen's co-integration, Granger-causality tests and VECM. Exchange rate was found to be the only factor explaining BIST100 and BIST-100 was shown to Granger-cause the oil price only. Demir (2019) and Tiryaki & Tiryaki (2019) applied the ARDL method. Impacts of macro factors such as the economic growth, the relative value of the domestic currency, portfolio investment and foreign direct investment, interest rate and crude oil price on BIST100 index were analyzed in Demir (2019), over the 2003Q1–2017Q4 period. Findings revealed that economic growth, relative value of the domestic currency, portfolio investment and foreign direct investment had positive but interest rate and crude oil price had negative effects on BIST100 index. Tiryaki & Tiryaki (2019) investigated the short-run and long-run macroeconomic determinants of BIST100 index and BIST industry returns by using monthly data from 1991:1 to 2017:M12. The explanatory variables

were the industrial production index, real effective exchange rate, consumer price index, interest rate, geopolitical risk index for Turkey and the economic policy uncertainty index of the United States. In the long-run, BIST returns were shown to be affected by the changes in industrial production, real exchange rate, consumer prices and economic policy uncertainty index. Bağcı & Çıtak (2020) forecasted the macroeconomic determinants of stock prices in Turkey by using the Multivariate Adaptive Regression Splines (MARS) Model by monthly data 2010:01 – 2019:12. They found inflation rate, gold prices, industrial production index, money supply, exchange rate, credit volume, and internal debt stock were essential in explaining the stock prices.

Aydin & Cavdar (2015) used monthly data (January 2000 to September 2014) to explain the relationship among the variables: USD/TRY exchange rate, gold prices and BIST100 index, in a multi-equation context. The predictive quality of future observations of the artificial neural network (ANN) model was compared to that of the VAR model and was found that ANN model performance was superior in explaining the paths of the three variables in terms of each other. Filiz & Öz (2017) modeled the daily BIST100 returns (January 1, 2006 to December 1, 2016) as depending on Euro/Dollar parity, gold price, crude oil price, monthly interest rate, inflation, DAX, FTSE, S&P 500 indices. They focused on k-nearest neighbor (k-NN), naive Bayes, logistic regression and C4.5 classifier methods and found that C4.5 and logistic regression' s model successes were the best. Their investigations involved whether the BIST100 would increase or decrease compared to the day before. Kartal et al. (2020) determined the order of importance of different variables on the BIST100 returns in Turkey by using daily observations ranging from 01.02.2020 to 05.15.2020, through RF and support vector machine (SVM) algorithms. They also aimed at identifying the effects of COVID-19 pandemic on the market and used 3 global, 6 country-level, 5 market-level variables to classify the variables. MSCI emerging markets index and the volatility index stood out to be important for Borsa Istanbul both in the pre-pandemic and pandemic periods. Also, SVM algorithm was found

to be superior to the RF algorithm in both periods. Filiz et al. (2021), is another classification study that investigated the directional change in the BIST-100 index via machine learning algorithms using daily observations (2006 through 2020) of 25 world stock indices and 3 macro variables (USD/TRY, EUR/TRY exchange rates and world gold price). They showed that higher success rates were achieved if they used fewer number of variables in classifications. Öztürk & Tokat (2021), made use of deep learning methods (NARX and LSTM) together with the Toda-Yamamoto procedure, to analyze the relationship between BIST100 prices and real exchange rate via daily observations 2003:01-2021:03. NARX model outperformed the LSTM model. Alp et al. (2020) examined whether the model performances of deep learning methods were better than the conventional autoregressive integrated moving average (ARIMA) method's in predicting the BIST 30, BIST 50 and BIST 100 price indices. Based on the root mean square metric, it was shown that ARIMA models outperformed the rival deep learning methods.

In this study, we intend to examine the effects of key macro variables on Turkish returns by using a wide range data and identify the impact of these variables. We implement tree-based machine learning techniques: decision tree, bagging, random forest and gradient boosting machines and compare the prediction qualities with a multivariate regression model. Rather than deducing the future directional changes of the BIST100 returns, we make predictions based on regressions and analyze the non-linear relationships of the BIST100 returns with the key macroeconomic indicators one by one through the partial dependence plots.⁶ We are also motivated by the concern that we include important macro variables such as the industrial production and inflation in the dataset, that are unavailable on daily basis.

DATA AND VARIABLES

The response variable in our study is the returns of the Borsa Istanbul National 100 index. Our study embodies the macroeconomic variables frequently used in the literature. Our domestic macro series

⁶ See also Ozgur et al. (2021).

are the industrial production index, real exchange rate, consumer price index (converted to monthly percentages to obtain the inflation rate), and short and long-term interest rates.

Table 1. Description of the variables used in empirical analysis.

<i>Acronym</i>	<i>Series</i>
BIST	Monthly returns of the BIST100 index
IPI	Monthly % change in the Industrial Production Index
RER	Monthly % change in the Real Effective Exchange Rate (CPI based) (2003=100)
INF	Monthly % change in the Consumer Price Index (2003=100)
OBR	CBRT Overnight Borrowing Rate (%)
LIR	Government bond yields (ten-year maturity) (%)
OIL	Monthly % change in the European Brent crude oil prices per barrel (in terms of the US dollar)
GOLD	Monthly % change in the London gold prices per ounce (in terms of the US dollar)
MSCIEF	Monthly % change in the MSCI Emerging Markets Index
VIX	Monthly % change in the Chicago Board Options Exchange (CBOE) volatility index

Following Kartal et al. (2020), the MSCIEF and global volatility index (VIX) are included in the model. The variables MSCIEF and VIX are obtained from the <https://www.tr.investing.com/> web site (tr.investing.com, 2022). Long-term interest rates are extracted from Eurostat (Eurostat, 2022). All other variables are extracted from the e-data delivery system of the Central Bank of the Republic of Turkey (CBRT, 2022). The list of all variables is provided in Table 1. Interest rates both are taken in percentages. All other variables are converted to monthly percentage changes. The dataset includes 181 monthly observations ranging from 2006:11 to 2022:01.

Industrial production index is included in the model as a proxy for GDP. IPI demonstrates the economic activity in an economy because it captures the real output in sectors such as manufacturing,

electricity, and mining. A positive relationship is expected between the change in the industrial production index and the stock returns.

Real exchange rate is one of the key determinants of firm profits through the cost effect if the firm's production depends on foreign goods and services. Depreciation of local currency increases the cost of production (with imported inputs), decreasing the profits and investment of the local firms. Furthermore, the firms' balance sheets deteriorate due to increased foreign currency-denominated debts. On the other hand, depreciation of domestic currency makes domestic goods cheaper in foreign markets, inducing exports. Also, it makes foreign goods expensive and encourages consumers to switch to cheaper domestic products. Real exchange rate is included in the model to incorporate these conflicting effects.⁷

Inflation is another factor studied by researchers. Higher inflation reduces the real stock returns and the present value of the future cash flows, hence increasing the riskiness of stocks. Consequently, the investor requires a higher rate of return. Inflation also affects stock returns through the cost of living. Higher inflation increases the cost of living in a country and increases the consumption spending increasing the aggregate demand for the firms' products. Finally, inflation reduces the purchasing power and stocks may act as a hedge against inflation. Depending on which effect outweighs the other, the sign of the relationship is determined.

Money supply, inflation, and nominal interest rates determine the real interest rate in an economy (Colander, 1998). The real interest rate is closely related to the investors' expected rate of returns and affects the cost of borrowing of both firms and individuals. Firms tend to delay or even cancel investments when interest rates are higher. Moreover, higher interest rates increase the required rate of return.

⁷ Real exchange rate is an index and calculated as: $RER = \prod_{i=1}^N \left[\frac{P_{Tr}}{P_i * e_{i,Tr}} \right]^{W_i}$ where, N is the number of countries, W_i is the weight of country i in the index, P_{Tr} is the price index in Turkey, P_i is the price index in country i, $e_{i,Tr}$ is the value of country i's currency in terms of Turkish Lira. An increase in the RER index corresponds to an appreciation of Turkish Lira in real terms and vice versa (Kocakale & Toprak, 2015, p. 6).

Theoretically, a negative relationship is expected between the stock returns and interest rates.

Last, the MSCIEF and VIX are included in the empirical analysis. We expect MSCIEF and VIX to be positively correlated with BIST100 returns. BIST100's lagged return is expected to be negatively correlated with the current BIST100 returns, since stock market returns are believed by many to exhibit mean reversion.

As stock markets do not respond contemporaneously to the changes in macroeconomic variables, each variable's highly correlated lag is included in the analysis. Because the research employs monthly data, all 12 lags are considered at the beginning and correlation coefficients are calculated afterwards. According to the correlation analysis, BIST.L10, IPI.L4, RER.L1, INF.L7, LIR.L6, OBR.L10, OIL.L9, GOLD.L9, MSCIEF.L1, and VIX.L1 have the highest correlation with the current BIST100 returns (L denotes lagged value).

Stock returns have positive correlations with the fourth lag of economic activity (IPI.L4), tenth lag of short-term interest rates (OBR.L10), sixth lag of long-term interest rates (LIR.L6), and first lag of MSCIEF (MSCIEF.L1). However, it has negative correlations with the first lag of real exchange rate (RER.L1), the seventh lag of monthly inflation (INF.L7), the ninth lag of Brent oil (OIL.L9), the ninth lag of gold (GOLD.L9), the first lag of VIX (VIX.L1), and the tenth lag of its own (BIST.L10).

METHODOLOGY

This research employs various machine learning techniques besides a multivariate linear regression in analyzing the macroeconomic factors affecting stock returns in Borsa Istanbul. The functional form is given in the compact form as below:

$$BIST = f(BIST, IPI, RER, INF, OBR, LIR, OIL, GOLD, MSCI, VIX) \quad (1)$$

where in Equation (1), all variables appear as lags on the righthand side. The optimal lags of each variable are used, and they are determined through the correlation analysis as discussed in the previous section.

Decision trees (also called regression trees) are the foundation of all other tree-based methods such as random forest. A decision tree uses if-then statements to optimally split the dataset into subsamples by selecting the best variable yielding a higher impurity of the response variable (Basuchoudhary et al., 2017).

In the decision tree algorithms, all data are represented at the root node at the top. Each decision node represents an if-then test on a variable. At each node, data is partitioned depending on the answers to maximize the purity of the outcome variable by selecting the best variable at each node (Breiman et al., 1984).

This method finds the best cut-points in the predictors to minimize the errors and then select the optimal predictor variable yielding the maximum improvement in the impurity within the node. Each terminal node (called leaf) represents the final decision for a tree. Thus, the best performing features are taken as the split nodes. Data are further recursively exposed to the same algorithm for further splitting. This search is finalized when it does not meet the improvement criterion in impurity or minimum observation criterion in a node.

The decision tree divides the predictor space, X_1, X_2, \dots, X_p into J distinct and non-overlapping regions, R_1, R_2, \dots, R_J . Then for every observation falling into the region R_j , making the same prediction by taking the mean of the response values for the training observations in R_j . The goal is to find regions R_1, R_2, \dots, R_J minimizing the residual sum of squares (RSS) given by the following equation (James et al., 2013):

$$RSS = \sum_{j=1}^J \sum_{i \in R_j} (y_i - y.pred_{R_j})^2 \tag{2}$$

where $y.pred_{R_j}$ is the mean response for the training observations within the j^{th} box. The most common measure for node impurity in regression trees is mean square error, denoted as:

$$R(d) = 1/n \sum_{i=1}^N (y_i - d(x_i))^2 \tag{3}$$

where $R(d)$ is the mean squared difference between response variable and predicted values.

Predictive accuracy of the decision tree -weak learner- is improved by random resampling (bagging and random forest) or modifying the distribution (boosting) (Basuchoudhary et al., 2017).

Decision trees can easily over-fit the data with many terminal nodes. However, it leads to poor out-of-sample performance. The solution is pruning the tree by imposing a cost parameter, like restricting the leaf nodes (Biau, 2012).

In this research, the decision tree model is employed using the *rpart* package in R, utilizing CART's (Classification and Regression Tree) regression tree-based approach.

The bagging algorithm proposed by Breiman (1996) grows multiple decision trees using the bootstrapped sampling approach. Therefore, it is sometimes called "bootstrapped aggregation." Each tree is grown with bootstrapped sub-sample, and data are partitioned at each node by selecting the best variable among all explanatory variables. Then, it fits a regression tree to each sub-sample, aggregating the predictions from each tree by averaging the individual predicted values for all the bootstrapped samples. An appropriate number of trees is grown to form a stable model. For each training set B , the predictions $f.pred$ are aggregated by averaging to obtain a single low-variance model. The final prediction is given by the following equation (James et al., 2013):

$$f.pred_{avr}(x) = \frac{1}{B} \sum_{b=1}^B f.pred^b(x) \quad (4)$$

Thus, the bagging tree improves the prediction accuracy of tree models by constructing a set of trees by re-sampling from the data and "averaging" the predictions of each. This process leads to more robust predictions than individual decision trees.

Random forest (RF) is also a decision tree-based algorithm, like the bagging. Developed by Breiman (2001), RF is a nonparametric ensemble prediction method for regression and classification and is known for its ability to deal with small sample sizes and a higher number of features (Biau and Scornet, 2016).

Similar to bagging, random forest creates multiple decision trees as predictors (called random forest). Each tree is grown with a

bootstrapped sample in random forest, and data are partitioned at each node by selecting the best variable among a random subset of all explanatory variables (such as features) (Biau, 2012). Then, the predictions produced by these individual trees are aggregated to get more accurate and stable predictions. It is called a random forest ensemble.

The error rates of the forest depend on the strength of individual trees and the correlation between trees. The correlation between individual trees needs to be decreased while the strength of individual trees is maintained to decrease the error rates (i.e., increase the accuracy) (Breiman, 2001). Choosing a random subset of explanatory variables at each node reduces the correlation among trees. Although individual trees may over-fit on different random samples; combined, their random errors will decrease by building many de-correlated trees on bootstrapped training, when multiple trees are and variance will be reduced by considering only a subset of variable at each node (James et al., 2013).

Random forest improves decision trees by selecting only a randomized subset of features like the split nodes. It makes the trees in RF less correlated because only a random subset of predictor variables is available for each split, resulting in a more diverse forest than bagging trees. Therefore, bagging is the particular case of random forest by taking the all of the features as the candidate as split node.

In Breiman (2001)'s terms, in a random forest, each tree predictor $h(X, \theta_k)$, $k=1, 2, \dots, K$ is trained on a different random subset of the original data. X is the input of length p and θ_k is the *iid* random vector. The random vector Θ for sampling is withdrawn with replacement-bootstrap samples. Random forest algorithm further improves the randomness by using a random subset of variables for each tree. m variables out of total M variables ($m < M$) are randomly selected for splitting at each node. The variable best separating the sample is chosen to divide the data down the tree. The final estimation of random forest $\{h(X, \theta_k)\}$ is determined by averaging of total trees in regression.

Gradient boosting machines (GBM), initially proposed by Friedman (2001), is a competitive and robust algorithm for regression and classification problems. It also builds on decision trees. However, it follows consecutive error-fitting approach in fitting each model. The algorithm starts with a single tree, and subsequent trees are grown sequentially on weighted observations based on errors in the previous regression. Notably, each decision tree is built on the errors of the previous one. Specifically, each iteration in the GBM algorithm approximates $F(x)$ mapping input vector x to y , minimizing the loss function $L(y, F)$ (Friedman, 2001).

In the GBM algorithm, a tree is fitted, and its prediction is updated by adding in a shrunken version of the new tree $f(x) + \lambda * f^b(x)$ and residuals are updated by $r_i - \lambda * f^b(x_i)$. The final prediction is given by the following equation (James et al., 2013):

$$f(x) = \sum_{b=1}^B \lambda * f^b(x) \quad (5)$$

Many performance metrics are used in machine learning algorithms to evaluate the estimates' validity and the models' predictive strength (Basuchoudhary et al., 2017). Once the model is trained using the learning dataset, the sample performance of the model is tested using the test dataset. One of the popular performance metrics in comparing continuous (regression) models is root mean squared error (RMSE). It is the square root of the mean squared error (MSE). RMSE penalizes the predictions with high errors (Ramasubramanian & Singh, 2019). Mean-squared generalization error of the tree predictor is given by

$$MSE = E_{X,Y}(Y - h(X))^2 \quad (6)$$

Mean Absolute Error (MAE) is another metric used to evaluate the performance of the models. It is the mean of absolute residuals given by the equation below (Ramasubramanian and Singh, 2019):

$$MAE = \frac{1}{n} \sum_{i=1}^n |e_i| \quad (7)$$

Variable importance and partial dependence plots identify the relationship and rank the variables based on their predictive capabilities (Basuchoudhary et al., 2017).

Machine learning algorithms' variable importance feature ranks the explanatory variables (input variables) based on their relative contribution to the model's predictive accuracy. Variable importance is determined based on impurity. Percent increase in MSE (%IncMSE) is calculated after permuting each predictor variable. The reduction in variance algorithm is used for regression problems.

Partial dependence plots can determine the magnitude and direction of the nonlinear impact of an explanatory (input) variable on the response (target) variable as it provides the marginal effect of an input variable conditional on observed values of other predictor variables (Basuchoudhary et al., 2017). The following function can give graphical representation of this plot:

$$\hat{f}(x) = \frac{1}{n} \sum_{i=1}^n f(x_k, x_{i-k}) \tag{8}$$

$$f(x) = \ln[p_1(x)] - \frac{1}{c} \sum_{s=1}^c \ln[p_s(x)] \tag{9}$$

where s indexes the classes of the target variable and C is the total number of classes.

The following procedure is used in all runs: the data are randomly divided into training and testing sets. The observations in the training set are used for learning purposes, and those in the testing set are used for validation purposes. Once the model is built, the model is cross-validated using a learning sample. In all machine learning settings, 75% of data is used to train the model, and the rest is used for validation. The final model is selected based on the predictive capability of models using out-of-sample data.

The best machine learning technique is identified using error metrics. Then, using the best technique the variable importance levels are identified. Variable importance scores rank the variables based on their predictive capabilities. Variable importance of each variable is determined based on impurity. Partial dependence plots are drawn to demonstrate the relationship between the variables and the Turkish

stock returns. Partial dependence plots can determine the magnitude and direction of the nonlinear impact of an explanatory (input) variable on the response (target) variable as it provides the marginal effect of an input variable conditional on observed values of other predictor variables. The predictive performances are measured per estimate errors in out-of-sample validation tests.

EMPIRICAL RESULTS

Table 2 reports root mean square error (RMSE) and mean absolute error (MAE). Multivariate linear regression (MVR) model is treated as the base model. Its RMSE and MAE are 4.96 and 4.17 respectively. DT model's RMSE and MAE are 6.40 and 4.90, respectively. DT does not help improve our model's error rates as much as the other models.

Table 2. Predictive Qualities.

Model	RMSE	MAE
Multivariate linear model	4.96	4.17
Decision Tree	6.40	4.90
Bagging	4.85	4.07
Random Forest	4.74	3.92
Gradient Boosting Machines	4.76	3.84

Bagging model's errors are 4.85 and 4.07. The bagging model's bootstrapped tree aggregation improves the performance of MVR and DT models.⁸ RMSE and MAE of the RF model are 4.74 and 3.92. Besides the bootstrapped tree aggregation, RF's randomization process of the number of variables randomly sampled as candidates at each split helps us improve error rates. Finally, RMSE and MAE of the GBM model are 4.76 and 3.84. This model also reduces the errors, revealing that the error-correcting process of GBM serves the purpose of improving error rates, as well.

According to Table 2, DT has the worst predictive quality considering both the error metrics. The RF model outperforms all the other algorithms based on the RMSE metric as it has the lowest out-of-

⁸ Averaging the bootstrapped trees reduces the variance and avoids overfitting.

bag errors in predicting stock returns. Based on the MAE, the GBM model outperforms all other algorithms. The two models' (RF and GBM) error rates are close. Here we choose to proceed with the model with the lowest RMSE, since it is a frequently used error metric and it punishes the large errors more than the MAE. Thus, our best model out of the competing ones is the RF model.

Table 3. Variable Importance Scores.

Variable	DT	Bagging	RF	GBM
MSCIEF.L1	22.17	16.37	67.91	75.45
IPI.L4	16.64	9.93	8.00	8.22
OBR.L10	10.74	7.90	7.26	3.44
RER.L1	3.71	9.93	4.40	2.15
BIST.L10	6.65	10.84	4.40	7.79
OIL.L9	0.00	8.69	4.06	0.00
INF.L7	6.19	8.13	2.54	0.00
GOLD.L9	12.17	9.14	2.36	1.08
VIX.L1	7.93	10.50	-0.03	1.87
LIR.L6	13.80	8.58	-0.90	-

Table 3 demonstrates the variable importance scores of explanatory variables in all machine learning models. RF model reveals that only MSCIEF.L1, IPI.L4, OBR.L10, RER.L1, BIST.L10, OIL.L9, INF.L7, and GOLD.L9 contribute to the model. GBM model determines that MSCIEF.L1, IPI.L4, BIST.L10, OBR.L10, RER.L1, VIX.L1, and GOLD.L9 contribute to the model. MSCIEF variable has the highest importance in all specifications. If MSCIEF is removed from the RF model for example, the RMSE increases by 67.91%.

IPI and BIST100's own lags, appear to be the other significantly important variables among the country-level macro variables. Variable importance scores of IPI.L4 are 8.00 and 8.22 in RF and GBM respectively. Variable importance scores of BIST.L10 are 4.40 and 7.79 in RF and GBM respectively.

According to RF model, monthly changes in the real exchange rate, oil price, inflation, and gold price do appear to contribute to the models, although their contributions are lower than those of MSCIEF,

OBR, and the IPI. The predictive power of long-term interest rate is much lower than that of the short-term interest rate. The variable importance of VIX is almost zero.

The nature of the relationship between explanatory variables and stock returns are examined next, through the partial dependence plots (PDPs). PDPs capture the nonlinear relationship between explanatory variables and the response (target) variable by illustrating the direction and functional form. It provides the incremental/marginal effect of an input variable on the target variable while accounting for the average effect of other variables in the model. The partial dependence plots provided in this section are obtained through the RF algorithm.⁹

Figures 1 through 8 demonstrate the PDPs of the explanatory variables with positive variable importance scores and BIST100 returns (target variable).¹⁰ Horizontal axis represents the range of explanatory variables, and the vertical axis represents the range of BIST100 return series. PDPs can display non-linear and complex relationships.

PDP in Figure 1 depicts a non-linear but a positive relationship between stock returns and monthly percentage changes in the MSCIEF. As mentioned before, the index has the most contribution percentage overall (67.91%).¹¹ From the PDP, we can see that the positive impact of the emerging market index on stock returns increases slightly until the changes in MSCIEF hit just over -10%. After that, increases in the emerging market index leads to significant increases in stock returns. Higher and positive percentage changes in the MSCIEF cause higher and positive changes in the BIST100 returns.

⁹ RF is our optimal model based on the predictive qualities of different algorithms considered. The next best model GBM also obtains similar partial dependence plots.

¹⁰ Interest rates and inflation are given in levels as percentages provided (%), all other variables are taken as the monthly percentage changes. The PDPs represent the change in the percentage changes in the input (X axis) and the target variables (Y axis).

¹¹ This result aligns with the results of Kartal et al. (2020) for both pre-pandemic and pandemic periods. However, the contribution of VIX is found to be negative (almost zero) in our RF model. Kartal et al. (2020) finds VIX as an important variable. Together with all the other domestic and global variables, the RF model does not show VIX to be an important indicator.

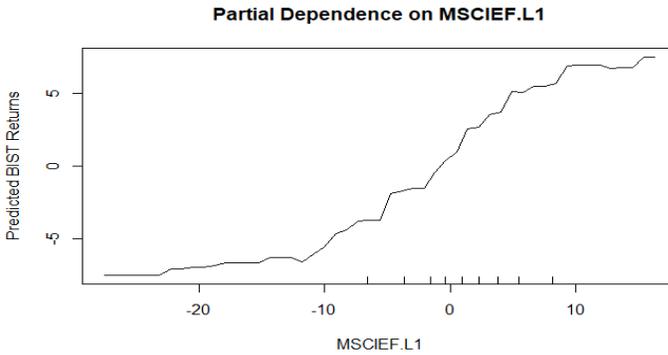


Figure 1. Marginal effect of MSCIEF.

The second influential variable is the IPI, which contributes optimally to the model through its fourth monthly lag. Among the country-level macroeconomic variables, the industrial production index turns out to be the most crucial one in explaining the stock returns. Figure 2 demonstrates the relationship between stock returns and the IPI. The PDP shows that there is a positive impact after the change in IPI.L4 hits 5%. The general tendency we observe from the PDP is a non-linear one over the spectrum. If we focus on the region where the change in the IPI returns is between 5% and 20% for example, we observe that higher the percentage change in the industrial production higher the percentage change in the stock returns (positive effect). For this obvious positive effect to occur, however, the change in the IPI returns should be between around 5% and 20%. An interpretation of a positive relationship supports the view that a stock's intrinsic value is determined by the discounted future cash flows (dividends), which primarily depends on the economic environment of the firm. A positive relationship between stock values and industrial production indicates that the stock market is a mirror of production and increased economic activity increases the cash flows/profitability of firms.

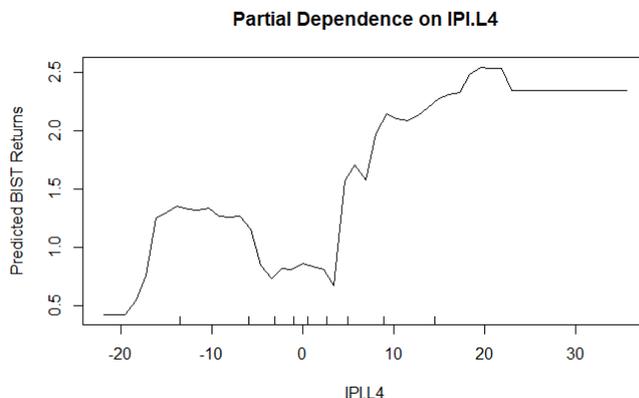


Figure 2. Marginal effect of industrial production index.

Another important macroeconomic factor for BIST100 returns is found to be the short-term interest rate. Figure 3 demonstrates the relationship between stock returns and the OBR. The partial dependence plot reveals that the relationship between stock returns and short-term interest rates is non-linear. It makes deducing the effect of the overnight borrowing rate difficult to figure out. Figure 3 shows that for positive changes in the OBR around 15%, there occurs a positive spike of stock return changes, after that the relationship is inverted. In general, for positive changes in the OBR, the effect on the BIST return changes tends to be small and positive. This is somehow conflicting because higher interest rates mean lower price to earnings ratios (P/E) for companies since cost of capital and borrowing are going up. However, during periods of tight monetary policy, inflationary pressures and exchange rate pressures are avoided, which also has favorable effects.

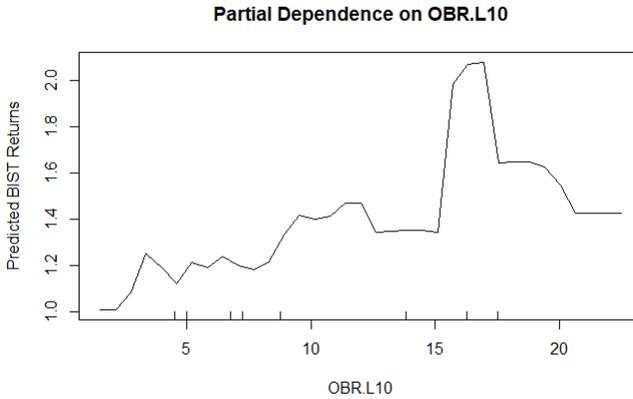


Figure 3. Marginal effect of overnight borrowing rate.

In Figure 4, the marginal effect of the real exchange rate is shown. BIST100 returns do not respond to changes in RER below -5% and above 5% ranges. If RER is decreasing, it corresponds to a depreciation of Turkish Lira (see Kocakale & Toprak (2015)). It has favorable effects on the stock returns, especially between the range -5% and 5%. A firm's value is expected to be influenced by exchange rates. When local currency depreciates, local firms become more competitive and exports rise, which also raises the stock prices. A counter effect is also possible since local firms rely on imported inputs. The overall effect is determined empirically (Harchaoi et al., 2005).

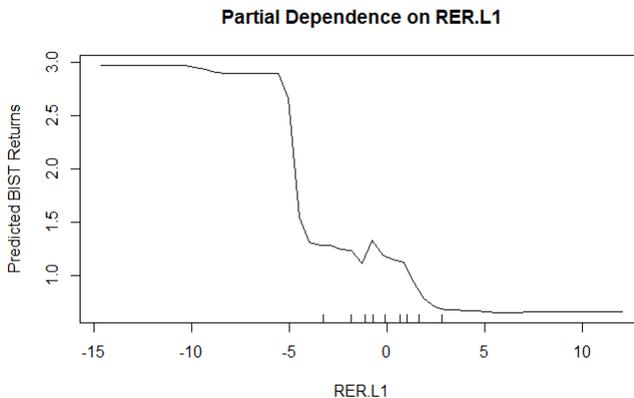


Figure 4. Marginal effect of real exchange rate.

Figure 5 demonstrates the partial dependence plot of tenth lag of BIST100 returns on itself. This graph mainly suggests a negative association. Higher the earlier stock returns lower the stock returns in the current month. However, this negative effect diminishes when monthly changes in BIST.L10 are below -10% and above 10%, where the stock returns do not respond to changes in its own lag. The shape of the PDP in Figure 5 suggests that Borsa Istanbul is a stock market where the returns follow a mean-reverting process: past positive moves of stocks negatively impact their current performance and vice versa. Although PDP shows the plot of the difference of the returns, it still confirms a situation where the return series also display mean-reverting behavior since the difference of a mean-reverting or $I(0)$ process will also be mean-reverting.

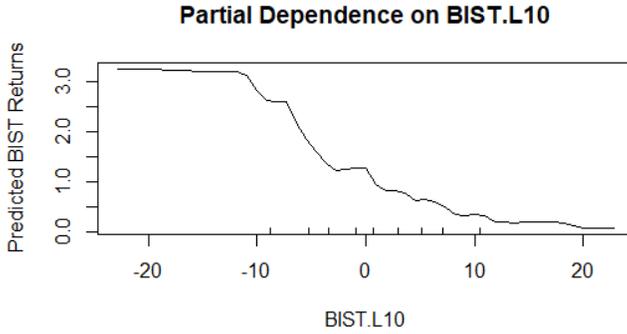


Figure 5. Marginal effect of BIST100 index’s own lag.

In Figure 6, we plot the PDP of gold prices. There exists a negative relationship between change in gold prices (ninth lag) and the change in the BIST100 returns when the percent changes in gold prices are positive. This negative relationship disappears for the region where gold returns are negative. In that region, it is hard to conclude on a directional effect, stock returns mostly do not respond to the changes in gold prices.

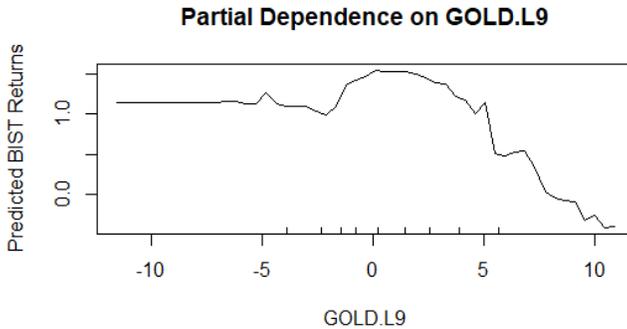


Figure 6. Marginal effect of gold price.

If gold return changes are negative, that does not induce the investors to switch and invest in Borsa Istanbul, thus does not affect the stock prices or returns. If gold return changes are high and positive,

however, it induces the investors to do otherwise, as the BIST100 returns get lower. This associates with the safe haven property of gold for the financial markets (Gold as a Safe Haven, 2022). If there are low returns observed in the financial markets, investors switch to safe haven assets such as gold, to refrain from these low returns, this in turn increases the price of gold. Figure 6 demonstrates the negative association of high and positive gold returns with low and negative stock market returns, a situation not inconsistent with the safe haven property of gold.

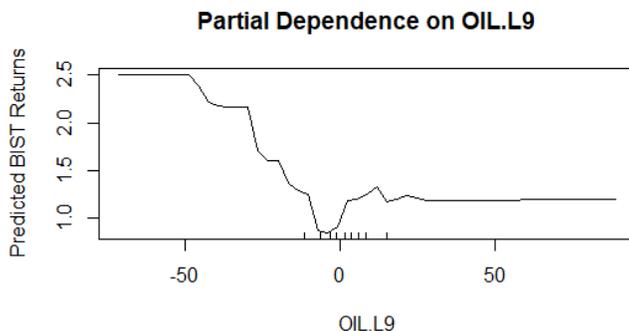


Figure 7. Marginal effect of Brent oil price.

The variable importance score of oil price (Brent) is relatively low. Concerning the direction of the relationship, Figure 7 demonstrates a non-linear one. If we focus on the region where the oil price changes are negative, it implies the existence of a negative association. Concerning that oil is an essential input, negative percent changes can induce stock values positively. We also observe that the stock returns do not really respond to the changes in oil prices where the oil price changes are positive.

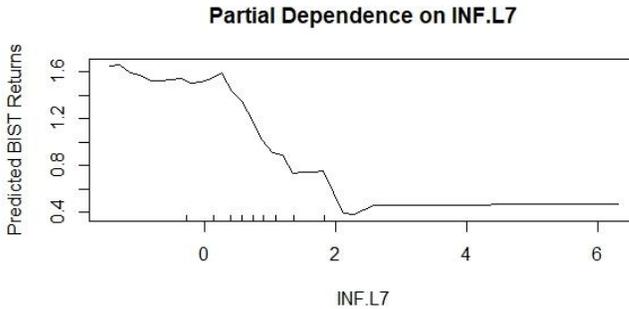


Figure 8. Marginal effect of inflation rate.

Although inflation's importance score is lower compared to the IPI or the RER, it still is a domestic macro variable that improves the predictive qualities of the RF model. Figure 8 shows the PDP of inflation for the BIST100 returns. There is an obvious negative effect of inflation on the stock returns between the range where inflation changes are greater than 0% and lower than 2%. For all other regions of marginal changes in the inflation rate, BIST100 returns are unaffected.

We do not find that the long-term interest rate (LIR) and the global volatility index (VIX) have improving qualities in our model. Thus, these two variables' dependence plots are not reported in this section.

Specifically focusing on the interest rates, both seem to have small effects on the equity market. The OBR appears as important from the variable importance scores, however, its PDP shows effects that are not too big and a non-linear pattern of relationship. Borio & Hofmann (2017) have investigated the questions and concerns about the effectiveness of monetary policy in boosting the economy in a low interest rate environment. They point out that such non-linear relationships arise during low interest rate policy periods and cause the effect of changes in the interest rates on aggregate demand and output

to be smaller.¹² Longer periods of low interest rate policies endanger the effectiveness of monetary policy. A fact, together with the empirical results of this section, directs attention to the ongoing debates about the effectiveness of the monetary policy in Turkey.¹³

CONCLUSION

Realizations of stock prices need to be justified by macroeconomic variables because macroeconomic variables of a country and international financial outlook affect the fundamentals of companies. Our research contributes to the literature in ways to address the critical role of macroeconomic and global variables by benefiting from the prominent advantages of new machine learning techniques. Machine learning techniques have advantages over the traditional econometric techniques. First, they are nonparametric models. Hence, they do not suffer from misspecification of the functional form. Also, they are more robust to outliers and do not depend on distributional assumptions. Moreover, with advanced computational powers, machine learning techniques can address large data sets. Machine learning techniques are critical in ranking the explanatory variables per their predictive power. Lastly, their partial dependence plots help one visualize the non-linear linkages in detail. In brief, we are motivated that the machine learning techniques (four tree-based: decision tree, bagging, gradient boosting, random forest, besides a multivariate linear regression model) will help us better explain the BIST100 index returns through the input variables: industrial production index, gold price, real exchange rate, Morgan Stanley Capital International emerging markets index (MSCIEF), short-term (Central Bank overnight borrowing rate) and long-term interest (10-year bond-rate) rates, Brent oil price,

¹² The effects of net interest margins and bank profitability on credit supply, changes in consumption and saving behavior, resource misallocations, confidence and expectations of the public also complicate the economic outlook, causing non-linearities.

¹³ Turkish Central Bank has been following a low interest rate policy.

inflation rate, and the global volatility index (VIX), together with BIST100 returns' own lag.

Our research investigates the nature of the macroeconomic and global variables' impacts on stock returns in Turkey using monthly data between 2006:11 and 2022:1. Random forest algorithm outperforms the other techniques based on the root mean squared error metric. The variable importance scores show us which of the lagged variables of global and domestic macro factors are important determinants of Turkish stock returns. Specifically, the Morgan Stanley Capital International emerging markets index, Brent oil price, gold price as global variables; the industrial production index, central bank overnight borrowing rate, real exchange rate, inflation rate, and BIST100's own lag as domestic macro variables stand out in modelling the current BIST100 returns. The long-term interest rate and VIX variables are not found to be important determinants of the model. Random forest's partial response plots generally reveal non-linear relationships.

MSCIEF is found to be the most important variable affecting the Turkish stock returns. Borsa Istanbul is a market that is closely tied to the emerging markets and any news affecting the MSCIEF favorably, affect the BIST100 index returns favorably. Among the country-level macro factors, the industrial production index has the highest impact. The relationship tends to be positive when the percent changes in the IPI are positive and increasing. It aligns with the proposition that a firm's profitability is primarily determined by the overall economic activity in a country. Improving economic conditions can increase the overall profitability of firms and affect stock returns favorably.

Our empirical findings also suggest that the real exchange and short-term interest rate are the two other contributing macroeconomic factors. The sign of the relationship with the stock returns tends to be positive with a real exchange rate depreciation, for the short-term interest rate, sign changes and non-linearities are observed. Although we detect a positive association between the changes in the short-term interest rate (OBR) and the changes in the BIST100 returns partially, this effect appears to be small.

BIST100 returns' tenth lag is found to be optimally affecting the current returns. The partial dependence of the lagged BIST100 returns on the current one indicates a negative correlation. This conclusion is consistent with BIST100 returns being mean-reverting: if there exists an outperformance (and vice versa) in the market, it is expected to last for a while, but corrected in the following periods.

Brent oil price is another global economic factor contributing to the model. The partial dependence plot suggests that if the percentage change in the oil price decreases, BIST100 returns are affected positively. The effect of oil prices might not work directly, but through the macroeconomic outlook (European Central Bank, 2004, p. 44). Decreasing oil prices can increase economic growth prospects, in turn, increasing the companies' earnings expectations. Since oil is an important input, a decrease in its price increases profit margins. Also decreasing oil prices decreases the uncertainty about the corporate earnings in the future.

Inflation rate and global gold prices have the least effects on the model. The effect of inflation does not seem to be crucial, although for a small range, inflation's PDP represents a negative relationship, associating lower returns with rising inflation rates. The sign of the relationship between gold price changes and BIST100 returns is found to be negative for increasing gold prices. The negative relationship of high and positive gold returns with low and negative stock market returns, associates with the safe haven property of gold as an asset for Borsa Istanbul.

The overall results of the relationships of the interest rates with the BIST100 returns direct attention to the debates about the effectiveness of the ongoing monetary policies of the Turkish Central Bank on the equity market and the economic outlook in Turkey (see for example Arestis et al. (2021)). Global volatility index has not found to significantly contribute to the model.

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